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STATE OF TENNESSEE

REPORT OF

R. A. SHIFLETT

CHIEF MINE INSPECTOR

1910

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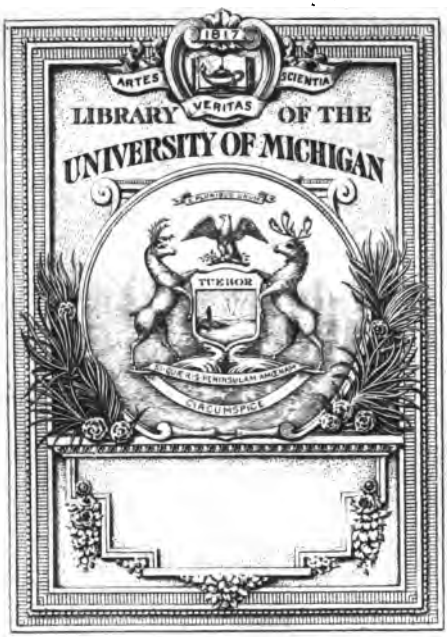
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TWENTIETH ANNUAL REPORT

OF THE

MINING DEPARTMENT

COMPLIMENTS OF THE

MINING DEPARTMENT OF TENNESSEE

The annual report edition of the Mining Department being limited, the name of those failing to acknowledge receipt of the book will be stricken from the mailing list. Editors of periodicals will please forward copy of issues containing notice of review.

GEO. E. SYLVESTER
CHIEF MINE INSPECTOR

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STATE OF TENNESSEE. Mining Dept.

TWENTIETH ANNUAL REPORT

OF THE

MINING DEPARTMENT

R. A. SHIFLETT
CHIEF MINE INSPECTOR
NASHVILLE

MINERAL RESOURCES OF TENNESSEE

1910

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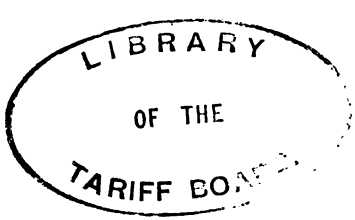

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LETTER OF TRANSMITTAL.

OFFICE OF CHIEF MINE INSPECTOR.

NASHVILLE, TENN., June 1, 1911.

To His Excellency, Hon. B. W. Hooper, Governor of Tennessee:

DEAR SIR: I herewith submit to you the Twentieth Annual Report of this Department, embracing the mineral resources of Tennessee for the year 1910.

Very respectfully,

R. A. SHIFLETT,

Chief Mine Inspector.

INTRODUCTION

The arrangement and scope of this report are the same as the preceding reports of this department since 1903. Each report covers the development of the mineral industry of the State during the period covered. Each chapter is a census of the productive features of the industry under discussion.

Owing to the many different units of measurements used by the mining industry in reporting mineral product it is impracticable to compare the outputs of the several minerals except as to value of product.

The value of the total net mineral product of Tennessee in 1910 amounted to $18,227,699. As compared with 1909 this is an increase of $1,046,239, or 6.09 per cent.

In importance as to mineral product, coal ranks first, pig iron second, copper third, stone fourth, clay products fifth, and phosphate rock sixth.

There were 22,306 employes engaged in mining, and in the reduction of mineral products, who received for their labor the sum of $9,349,806.

As compared with other States, the rank of Tennessee as to minerals is as follows: Coal product, 12; coal value, 13; clay products, 23; coke, 13; copper, 7; gashouse coke, 20; Iron ore, 9; pig iron, 8; limestone, 12; marble, 3; phosphate rock, 2; pottery, 14; and sand and gravel, 13.

FUELS.

Coal—The production of coal in 1910 amounted to 6,908,688 short tons, valued at $7,626,840. As compared with 1909, this is an increase in product of 701,205 short tons, or 11.29 per cent, and an increase in value of $869,016, or 12.86 per cent.

Coke—The production of coke in 1910 amounted to 392,647 short tons, valued at $993,465. As compared with 1909, this is an increase in product of 129,897 short tons, or 49.43 per cent, and an increase in value of $323,918, or 48.38 per cent.

Gas, gashouse coke, tar and ammonia—The aggregate value of all products obtained by the distillation of coal in gas works and retort ovens, and of oil and water gas, made in 1910, amounted to $1,099,670. As compared with 1909, this is an increase of $107,679, or 10.85 per cent.

METALS.

Copper—The production of copper in 1910, amounted to 16,837,727 pounds, valued at $2,081,500. As compared with 1909, this is a decrease in product of 2,245,372 pounds, or 11.76 per cent, and a decrease in value of $308,484, or 12.90 per cent.

Gold—The production of gold in 1910 amounted to 306 fine ounces, valued at $6,122. As compared with 1909, this is an increase in product of 25 fine ounces, or 9 per cent, and an increase in value of $499, or 8.87 per cent.

Iron ore—The production of iron ore in 1910 amounted to 674,693 long tons, valued at $988,281. As compared with 1909 this is an increase in product of 25,868 long tons, or 4 per cent, and an increase in value of $52,318, or 5.59 per cent.

Iron, pig—The production of pig iron in 1910 amounted to 397,490 long tons, valued at $5,206,293. As compared with 1909, this is an increase in product of 66,879 long tons, or 20.22 per cent, and an increase in value of $732,554, or 16.4 per cent.

Silver—The production of silver in 1910 amounted to 111,588 fine ounces, valued at $56,875. As compared with 1909, this is a decrease in product of 12,674 fine ounces, or 10.2 per cent, and a decrease in value of $5,472, or 8.77 per cent.

Zinc—The production of zinz in 1910 amounted to 2,132,082 pounds, valued at $115,132. As compared with 1909, this is an increase in product of 559,006 pounds, or 35.53 per cent, and a decrease in value of $837, or .72 per cent.

STRUCTURAL MATERIALS.

Cement—The production of Portland cement in 1910 amounted to 770,000 barrels, valued at $478,893. As compared with 1909, this is an increase in product of 170,000

barrels, or 28.33 per cent, and a small decrease in value of $1,107.

Clay products—The value of all clay products in 1910 amounted to $1,423,940. As compared with 1909, this is an increase in value of $71,671, or 5.30 per cent. The value of brick and tile product amounted to $1,182,467. As compared with 1909, this is a small increase of $1,424. Pottery products were valued at $127,817. As compared with 1909, this is an increase of $41,627, or 48.20 per cent. The production of commercial clay mined and sold in 1909 amounted to $113,656. As compared with 1909, this is an increase of $41,026, or 56.5 per cent.

Lime—The production of lime in 1910 amounted to 84,342 short tons, valued at $257,873. As compared with 1909, this is a small decrease in product of 52 short tons, and a decrease in value of $11,639, or 4.32 per cent.

Stone—The value of all stone product in 1910, including limestone, marble and sandstone, amounted to $1,490,188. As compared with 1909, this is an increase of $297,938, or 25 per cent.

The production of limestone in 1910 amounted to 913,556 short tons, valued at $612,456. As compared with 1909, this is an increase in product of 9,379 short tons, or 1 per cent, and an increase in value of $12,266, or 2 per cent

The production of marble in 1910 amounted to 464,636 cubic feet, valued at $877,432. As compared with 1909, this is an increase in product of 130,362 cubic feet or 39 per cent, and an increase in value of $286,847, or 48.6 per cent.

The production of sandstone in 1910 amounted to 225 short, valued at $300. As compared with 1909, this is a decrease in product of 509 short tons, and a decrease in value of $1,175.

Of the total limestone product, 619,368 short tons, or 67.8 per cent, valued at $427,012 were used as crushed stone for the construction of roads, railroad ballast and concrete. As compared with 1909, this is an increase in crushed stone product of 25,593 short tons, or 4.31 per cent, and an increase in crushed stone values of $35,592, or 9.09 per cent. Of the total crushed stone product, 369,585 short tons, or 59.67 per cent, valued at $305,045, were used in the construction of good roads. As compared with 1909, this is an increase in product, used in road building, of 169,461 short tons, or 84 per cent, and an increase in values expended in road building of $111,126, or 57.28 per cent.

The limestone used for blast furnace flux in 1910 amounted to 234,697 short tons, valued at $120,616. As compared with 1909, this is an increase in product of 3,548 short tons, and a decrease in value of $356.

PIGMENTS.

Barytes—The production of barytes in 1910 amounted to 1,800 short tons, valued at $2,000. As compared with 1909, this is a decrease in product of 2,831 short tons, and a decrease in value of $4,946.

Mineral paints—The production of mineral paints in 1910 amounted to 1,385 short tons, valued at $11,757. As compared with 1909, this is a decrease in product of 250 short tons, or 15.3 per cent, and an increase in value of $4,095, or 53.44 per cent.

CHEMICAL MATERIALS.

Phosphate rock—The production of phosphate rock in 1910 amounted to 409,684 long tons, valued at $1,234,969. As compared with 1909, this is an increase in product of 60,843 long tons, or 17.44 per cent, and an increase in value or $99,395, or 8.75 per cent.

Sulphuric acid—The production of sulphuric acid in 1910, as a by-product in the manufacture of copper, amounted to 128,613 short tons, valued at $668,693. As compared with 1909, this is an increase of 62,028 short tons, or 93.15 per cent, and an increase in value of $369,210, or 123.28 per cent.

MISCELLANEOUS.

Mineral waters—The production of mineral waters in 1910 amounted to 920,725 gallons, valued at $63,004. As compared with 1909, this is a decrease in product of 68,452 gallons, or 6.92 per cent, and a decrease in value of $9,495, or 13.1 per cent.

Quartz—The production of quartz in 1910 amounted to 60,298 short tons, valued at $33,865. As compared with 1909, this is a decrease in product of 22,797 short tons, or 27.43 per cent, and a decrease in value of $47,692.

Sand and Gravel—The production of sand for molding, building, engine, furnace and other purposes, and of gravel for roofing, concrete and road making purposes in 1910, amounted to 521,745 cubic yards of 2,500 lbs. each, valued at $342,794. As compared with 1909, this is a decrease in product of 69,143 cubic yards or 11.7 per cent, and a decrease in value of $22,422, or 6.09 per cent.

In addition to the minerals herein named, there are other important and valuable mineral deposits in Tennessee that have never been developed. One of these is

COBALT,

which is found in Dickson, Hickman and Humphreys counties. Mr. Edison sent a prospecting representative to Hickman County in 1907, but no data or information relative to the results of his examination has ever been given the Mining Department. Other valuable mineral deposits which have been developed to some extent, are

FLOURSPAR.

which are located near Rome, in Smith County, and near Baxter, in Putnam County. Unsatisfactory freight rates and adverse trade conditions forced the operators to suspend operations in 1906. Though never developed to any appreciable extent, an exeellent deposit of

SLATE

is known to exist in Blount and McMinn counties. The depot at Walland is said to be covered with slate quarried from the property of Hon. Jake Tipton, near Townsend.

MINING LAWS.

Notwithstanding the fact that the salaries and some other details in connection with the office of the Mining Department should be readjusted, and some additional legislation affording increased safety to the miners, rendered necessary by extended developments, should be passed, the existing laws are giving general satisfaction to both miner and operator.

Many improvements have been made and new mining equipment and machinery installed by commercial operators reported active during the year.

The department has exercised every precaution to avoid accidents and explosions by placing many of the mines under special rules, restricting the charge of powder and quantity of powder taken into the mines, number of shots, time of firing, kind of tamping used, the employment of skilled men as shot firers, and the employment of gas bosses and inspectors, whose duty requires them to inspect the mines before the miners are allowed to enter. These rules and regulations have been formulated as a necessary supplement to the mining law, facilitating a full compliance with its provisions, and reducing the possibility of mine explosions to a minimum.

ACKNOWLEDGMENTS.

It would be impossible to present a report in such detail as this without the full co-operation of the individual operators and the officials of the operating companies, who not only furnished the product and other data called for in the schedules, but who replied promptly to special inquiries incident thereto, therefore the department extends to them its sincere appreciation.

Acknowledgments are due to the mine foremen, who have complied with the mining laws, as well as to quite a large number of miners, for co-operation with the mine inspectors in complying with the requirements of special rules formulated for their protection in the management of the mines.

Acknowledgments are also due Mr. Frederick L. Hoffman, expert statistician of Newark, N. J., for extracts from an ably edited article upon mining accidents in the United States and Canada, published in the Engineering and Mining Journal of New York City.

Acknowledgments are also due the United States Bureau of Mines and to the Chief of the Division of Mines and Mineral Resources, and other officials of the United States Geological Survey for valuable statistical extracts pertaining to the production of such minerals of the United States and of the world as are herein embraced, and to the Bureau of Statistics in the Department of Commerce and Labor for all data pertaining to the exports and imports of the various products herein reviewed.

Special acknowledgments are due District Mine Inspectors L. O. Stone and A. W. Evans, and District Mine Inspector and Statistician J. W. Allen, and R. H. Bartlett, clerk, for the comprehensive and efficient manner in which they have performed their respective duties.

BRIEF STATISTICS, 1910.

The following statement gives brief statistics of all operations in Tennessee engaged in the production of coal and other mineral substances, or the reduction of mineral products in 1910.

Brief statistics, 1910.

PRODUCT	Quantity of Product	Value of Product	Total Number of Employes	Average Wages Paid Per Day	Total Amount Paid for Labor
Barytes (short tons)	1,800	$ 2,000	16	$ 1.10	$ 1,800
Brick and tile		1,182,467	1,644	1.39	498,222
Cement (bbls)	770,000	478,893	460	1.52	219,743
Clay (short tons)	61,120	118,985	265	1.25	70,062
Coal (short tons)	6,908,688	7,626,840	11,174	2.05	5,192,418
Coke (short tons)	392,647	993,465	481	1.25	209,548
Copper (pounds)	16,837,727	2,081,500	793	2.08	467,035
Gas, gas-coke, tar and ammonia		1,099,670	336	1.76	177,907
Gold (fine ounces)	306	6,122	*a*	*a*	*a*
Iron ore (long tons)	674,693	988,281	1,503	1.70	524,667
Iron, pig (long tons)	397,490	5,206,293	1,283	1.49	563,186
Lime (short tons)	84,342	257,873	389	1.30	112,329
Limestone (short tons)	913,556	612,456	1,111	1.40	319,022
Marble (cubic feet)	464,636	877,432	838	1.35	306,898
Mineral paints (short tons)	1,385	11,757	32	1.85	9,725
Mineral waters (gallons sold)	920,725	63,004			
Phosphate rock (long tons)	409,684	1,234,969	1,307	1.33	476,182
Pottery		127,817	219	1.40	43,291
Quartz, [Crystalline, (short tons)]	60,298	33,865	65	1.60	28,081
Sand and Gravel (cubic yards 2500 lbs)	521,745	342,794	303	1.55	86,231
Sandstone (short tons)	225	300	2	1.50	170
Silver (fine ounces)	111,588	56,875	*a*	*a*	*a*
Sulphuric acid (short tons)	128,613	668,693	*a*	*a*	*a*
Zinc (pounds)	2,132,082	115,132	85	1.40	43,289
Total		$ 24,187,483	22,306	$ 1.75	$ 9,349,806

a Included in copper statistics.

There are some duplication of values in the above figures that should be excluded.

Pig iron is manufactured from coke, iron ore and limestone, therefore the value of these minerals used in pig iron manufacture should be deducted from total pig iron value, for the reason that the value of said minerals are either embraced in the value of coke, iron ore or limestone reported herein as being produced in Tennessee, or is the value of the product of other States and can not be properly included as a part of the value of the mineral product of Tennessee.

The clay mined in Tennessee to be sold by commercial operators is principally consumed in foreign States, but the value of that clay mined and sold to be used in Tennessee in the manufacture of brick, tiling, or pottery, should be deducted from the total value of clay mined, because its value is embraced in that of brick, tiling and pottery or other manufactured clay product herein reported.

The cost of coal coked is credited to coal values, and should therefore be deducted from coke values.

The value of all coal, oil, or other minerals used in the manufacture of gas, gashouse coke, tar and ammonia, should be deducted from the total value of these products, for the reason that their values are either included in the values of coal, oil, or other mineral reported herein, as having been produced in Tennessee, or is the product of other States, and can not be properly included as a part of the value of the mineral product of Tennessee.

From copper should be deducted the value of coke, limestone, crystalline quartz, or other minerals used in its manufacture, because it is either the value of the product of other States or included in the values of other mineral product of Tennessee herein given.

These duplication of values are as follows:

From clay products:

Value of Clay mined and sold to be manufactured in Tennessee	$ 5,329

From coke:

Coal used, 756,517 short tons, valued at	806,302

From copper:

Coke and all minerals used	220,792

From gas, gashouse coke, tar and ammonia:

All minerals used	229,577

From pig iron:

Coke	2,080,120
Iron Ore	1,682,647
Limestone (flux)	159,453
Other minerals	19,047
Total deductions to be made from Pig Iron	$3,941,267
Total deductions of duplicate values, all products	$5,959,784

With the elimination of the duplicated values given above, the total net value of all clay mined and sold amounts to $113,656; the total net value of all clay products amounts to $1,423,940; the total net value of coke amounts to $187,163; the total net value of copper amounts to $1,860,708; the total net value of gas and by-products amount to $870,093; the total net value of pig iron amounts to $1,265,026, and the total net value of all mineral products in Tennessee in 1910 amounts to $18,227,699.

BRIEF STATISTICS IN DETAIL AS TO COAL.

The following figures give brief statistics in *detail* as to coal in Tennessee in 1910:

Employes:		
Average number inside	9,669	
Average number outside	1 505	
Total average number of employes in and around mines		11,174
Average wages paid per day		$ 2.05
Total amount paid for labor		$5,192,418
Total average number of days active		236
Product (short tons):		
First District	1,607,496	
Second District	1,259,137	
Third District	4,042,055	
Total product		6,908,688
Value of product:		
First District	$1,843,629	
Second District	1,405,152	
Third District	4,378,059	
Total value of product		$7,626,840
Average value per ton of product		$ 1.10
Net increase in product as compared with 1909 (short tons)		701,205
Net increase in value as compared with 1909		$ 869,016
Draft animals employed:		
Inside	1,328	
Outside	337	
Total number of draft animals		1,665
Explosives used:		
Powder (number of kegs)		119,685
Dynamite (number of pounds)		180,169
Permissible explosives (number of pounds)		105,477
Mine cars in use		15,404
Mining machines in use:		
Pick	176	
Chain Breast	48	
Other kind	3	
Total number of mining machines in use		227
Quantity of coal mined with mahcines (short tons)		1,151,530
Improvements made:		
Value of inside improvements	$ 124,443	
Value of outside improvements	227,185	
Total value of all improvements made		$ 351,628
Accidents, number of:		
Fatal		38
Non-fatal		210
Total number of children rendered fatherless		48
Total number of wives made widows		30

COAL

The coal areas of the United States are divided into two great divisions—anthracite and bituminous.

The anthracite area is practically all in Eastern Pennsylvania, though there are two small areas located in the Rocky Mountain region in Colorado and in New Mexico.

The bituminous and lignite coal fields are scattered widely over the United States, and include an area of 496,000 square miles. Under the present classification, as shown by the report of the Department of Mines and Mineral Resources of the United States Geological Survey, these coal areas are divided into six provinces, as follows:

(1) The Eastern province, which includes all the bituminous areas of the Appalachian region; the Atlantic Coast region, which includes the Triassic fields, near Richmond; the Deep and Dan rivers' fields, in North Carolina; and the anthracite region of Pennsylvania.

(2) The Gulf province, which includes the lignite fields of Alabama, Mississippi, Louisiana, Arkansas and Texas.

(3) The Interior province, which includes all of the bituminous areas of the Mississippi Valley region and the coal fields of Michigan. This province is subdivided into the Eastern, Western, Southwestern and Northern regions. The Eastern region embraces the coal fields of Illinois, Indiana and Western Kentucky. The Western region embraces the coal fields of Iowa, Missouri, Nebraska, Kansas, Arkansas and Oklahoma. The Southwestern region embraces the coal fields of Texas, and the Northern region embraces the coal fields of Michigan.

(4) The Northern or Great Plains province, which includes the lignite areas of North and South Dakota, and the bituminous and sub-bituminous areas of Northeastern Wyoming and Northern and Eastern Montana.

(5) The Rocky Mountain province, which includes the coal fields of the mountainous districts of Montana and Wyoming, and all of the coal fields of Utah, Colorado and New Mexico.

(6) The Pacific Coast province, which includes all of the coal fields of California, Oregon and Washington.

The coal areas of Tennessee are embraced in the Appalachian region of the Eastern province, which extends from New York on the north to Alabama on the south, having a length northeast and southwest of more than 900 miles, and a width ranging from 30 to 180 miles. This region embraces the coal fields of Pennsylvania, Ohio, Maryland, Virginia, West Virginia, Eastern Kentucky, Tennessee, Georgia and Alabama, having a combined area of 70,807 square miles underlaid with coal, which in 1909 produced 251,630,500 short tons, or 66.26 per cent of the total bituminous coal product of the United States.

The coal field of Tennessee, embracing an approximate area of 4,400 square miles, is divided into three coal districts. The first district comprises the counties of Bledsoe, Cumberland, Fentress, Franklin, Grundy, Marion, Overton, Putnam, Sequatchie, Van Buren and White. The second district comprises the counties of Hamilton, Morgan, Rhea, Roane and Scott, and the third district comprises the counties of Anderson, Campbell and Claiborne. The estimated original coal contents in this area amounted to 25,665,000,000 short tons. Deducting the estimated total exhaustion to close of 1909, amounting to 145,000,000 short tons, there is left 25,520,000,000 short tons as the estimated available supply January 1, 1910, or 99.44 per cent of the estimated original supply.

COAL PRODUCT.

The first evidence of substantial recovery from the industrial depression in 1907 is shown by the coal product of 1910. The total product amounted to 6,908,688 short tons, valued at $7,626,840, or $1.10 per ton. As compared with 1909, this is an increase in product of 701,205 short tons, or 11.30 per cent, and an increase in value of $869,016, or 11.40 per cent. In the first district there was an increase in product of 258,951 short tons, and an increase in value of $302,444. In the second district there was an increase in product of 154,591 short tons, and an increase in value of $199,393. In the third district there was an increase in product of 287,663 short tons, and an increase in value of $367,179.

Increases as to both product and value occurred in the counties of Anderson, Bledsoe, Campbell, Claiborne, Fentress, Grundy, Hamilton, Marion, Morgan, Overton, Rhea, Roane, Scott, Sequatchie and White. Decreases in product and value occurred only in the county of Cumberland.

Coal product as herein treated embraces coal marketed by shipment amounting to 6,096,492 short tons, or 88.25 per cent, of total product, coal used for fuel and steam, amounting to 134,657 short tons, or 1.95 per cent of total product; coal sold to local trade and employes, amounting to 62,214 short tons, or 0.90 per cent of total product and coal coked, amounting to 615,325 short tons, or 8.90 per cent of total product. An average of 63,969 short tons of coal was produced for each operating plant, and 44,861 short tons of coal produced for each mine reported active.

COAL MINED BY MACHINES.

In 1910 there were 227 mining machines in use in Tennessee, there were 27 firms using mining machines at 29 different mines, and there were 1,151,530 short tons of coal, or 16.66 per cent, of total product mined with machines. As compared with 1909, this is an increase of total machines in use of 44, an increase of three firms using machines, an increase of 188,122 short tons of coal mined with machines and an increase in percentage of coal mined with machines of 1.14 per cent. There were an average of 5,073 short tons of coal produced for each mining machine in use. There were 39 mining machines used in the first district, 24 in the second district, and 164 in the third district; 52 are pick Harrison, 92 are pick Ingersoll-Sargent, 30 are pick Sullivan, and 2 are pick (other kinds), 12 are chainbreast Jeffrey-electric, 22 are chainbreast Sullivan, 11 are chainbreast Goodman, 3 are chainbreast Morgan-Gardner, and 3 other kinds. Of the total machine mined product 77 per cent was produced in the third district, comprising the counties of Anderson, Campbell and Claiborne, and 37.10 per cent was produced in Campbell county alone. During 1898, the first year of reported use of mining machines in Tennessee, there were produced 152,002 short tons, or 5.3 per cent of total coal product by machines.

The total machine mined coal tonnage for the United States in 1909 amounted to 142,496,878 short tons, or 38.03 per cent of total coal product, which is an increase of 0.51 per cent in the percentage of machine mined product, to the total coal production. The total number of mining machines in use increased from 11,569 in 1908 to 13,049 in 1909. The percentage of coal product mined with machines in 1909 to the total coal production is as follows: Ohio (the highest in rank), 79.50 per cent; Kentucky, 60.50 per cent; Indiana, 50. per cent; Pennsylvania, 41.68 per cent; West Virginia, 40.80 per cent; Illinois, 34. per cent; Montana, 32.90 per cent; Michigan, 28.70 per cent; Virginia, 27.88 per cent; North Dakota, 27.26 per cent; Wyoming, 22.38 per cent; Missouri, 21.20 per cent; and Tennessee, thirteenth in rank, 16.40 per cent. In 1908 Tennessee was fourteenth in rank.

LABOR.

The following table gives the cost of labor in the production of coal by districts and the amount paid to each class of employes:

Amount paid each class of coal employes in Tennessee in 1910, by districts.

KIND OF EMPLOYES	First District		Second District		Third District		Total	
	Total Amount Paid	Per Cent of Total Cost	Total Amount Paid	Per Cent of Total Cost	Total Amount Paid	Per Cent of Total Cost	Total Amount Paid	Per Cent of Total Cost
Pick miners	$ 809,395	66.50	$548,528	60.50	$1,605,915	54.49	$3,044,838	58.64
Haulage men	89,573	6.69	96,155	10.61	331,750	11.26	517,478	9.97
Foremen	30,726	2.30	24,216	2.67	71,303	2.42	126,245	2.43
Machine miners	52,089	3.89	40,431	4.46	307,078	10.42	399,598	7.70
Machine runners and helpers	24,335	1.82	7,927	.88	95,704	3.25	127,966	2.46
Others inside	84,244	6.30	95,676	10.55	175,050	5.94	354,970	6.84
Total inside	$1,171,362	87.50	$812,933	89.67	$2,586,800	87.78	$4,571,095	88.04
Blacksmiths	15,931	1.19	11,477	1.26	41,127	1.40	68,535	1.32
Timbermen	15,299	1.14	12,026	1.33	69,408	2.35	96,733	1.86
Others outside	136,278	10.17	70,151	7.74	249,626	8.47	456,055	8.78
Total outside	$ 167,508	12.50	$ 93,654	10.33	$ 360,161	12.22	$ 621,323	11.96
Grand total inside and outside	$1,338,870	100.00	$906.587	100.00	$2,946,961	100.00	$5,192,418	100.00

The average rate per day for all workers inside and outside, excluding those on coke ovens, amounted to $2.05. For more specific details as to wages paid per day to all employes, with specific nomenclature as to occupation, reference is made to the special table of statistics showing wages paid all coal mining employes, and to the wage scales printed elsewhere in this report.

LABOR TROUBLES.

There was no interruption to mining operations in 1910 on account of labor disaffection. There were no controversies of serious import between operators and employes, and the formerly vexed question of strikes, or suspensions incident to wage scale adjustments, was for the first year entirely eliminated from the coal mining industry of Tennessee. This is due to the fact that the miners have long since realized that an amicable adjustment of wage scales was the most profitable, and do not now permit the mining industry to suffer any idleness pending their consideration.

NEW DEVELOPMENTS.

New development during the year was limited to some small development in Campbell, Claiborne, Hamilton and Scott counties. The cost of improvements made amounted to $351,628, as against $191,778 in 1909. These expenditures embrace the cost of many new fans, mining machinery and other improvements looking to the proper preservation of safe conditions and the safety of the miners.

EXPLOSIONS.

It has been demonstrated that explosions in coal mines can occur from gas, gas and coal dust, or from coal dust without gas.

The effect of an explosion from gas is localized, unless dry coal dust is present, or the explosive mixture of air and gas extends throughout the mine. The accumulation

of gas can be prevented by thorough ventilation throughout the working places. If the current is sufficient and properly controlled it dilutes the gas and carries it away. This Department has in use a monthly report form which not only calls for the business operations of each mine, but for the weekly air readings at all headings worked. This report is recorded in the office, as required by law, in order that the records of the Department may affirmatively show that there is sufficient fresh air passing through the mines to meet all legal requirements. The effect of this work has been to minimize the possibilities of gas explosions and to protect the miner from violent death, and to increase his tenure of life.

Explosions from gas and coal dust, and from coal dust without gas, are both violent and destructive in their character, and are much more difficult to prevent than explosions from gas without the coal dust. The United States Bureau of Mines has recently made several tests as to the causes of mine explosions, at the testing station at Pittsburg, Pa., and has issued a circular on the question of coal-dust explosions which is conducive of much good, and will be of material assistance in reducing the number and effect of these disasters.

In order that the question may receive that careful consideration its importance so seriously demands, attention is called to the following extracts from this circular:

COMBUSTION AND EXPLOSION OF COAL DUST.

"When a piece of coal burns, the carbon and the other burnable substances in the coal unite with the oxygen of the air to form gases and water vapor. This union is called combustion. It is accompanied by flame and heat, and the resulting hot gases and vapor tend instantly to take up many times the space filled by the piece of coal and the oxygen needed to burn it.

A small piece of coal burns quicker than a large piece, and if a piece of coal of some kinds is small enough it will burn in a flash. If many particles of such coal are suspended in the air, as in a dust cloud, so that each particle has some oxygen near it, the burning of one particle may fire others and the flame may spread through the dust cloud in an instant. If this happens, the hot gases and vapor from the burning dust cloud suddenly take up more room and press outward in all directions; in other words, the mixture of coal dust and air explodes.

The fact that dry pure dust from bituminous coal, lignite, or asphalt explodes when ignited in the air has been proved beyond doubt by the tests at Pittsburg. Opinions differ as to the exact way in which the flame of the explosion spreads. Some persons think that gases given off by the particles of dust ignite and burn; others think that each bit of coal dust burns completely.

Dry coal dust in air will explode whether any inflammable gas is present or not; but the presence of a very small proportion, less than 1 per cent, of methane helps greatly to start an explosion. Fire damp, a mixture of air and 5.5 to 11 per cent of methane, explodes with great violence when ignited. But although a fire-damp explosion may be violent, it is probable that such an explosion never extends all through a mine unless the flame is supported by burning coal dust. Certainly, the strength of most great mine explosions has been derived from coal dust and not from gas.

The shock to the air from an explosion travels ahead of the flame itself, so it has happened that miners caught by an explosion have felt the shock in time to throw themselves down or into some opening before the flame swept by. This shock, or advance wave, of an explosion stirs up much dust, but generally all of this dust is not consumed in the flame because there is not enough oxygen present. So some of the dust is only charred or coked, and part of this while in a hot or half-pasty condition sticks to the ribs and roof, or to props and caps.

QUANTITY OF DUST NEEDED TO SPREAD AN EXPLOSION.

In certain tests at the mining experiment station at Pittsburg the bituminous coal dust used was so fine that it passed through a 200-mesh sieve (one with 200 openings in the length of an inch), and floated easily on a strong air current. This dust spread an explosion when there was only 0.32 ounce of it suspended in each cubic foot of air, or 1 pound in 500 cubic feet of air.

It can be shown that to burn completely 0.12 of the dust used at Pittsburg will take all the oxygen in a cubic foot of air; to burn a pound of it will take all the oxygen in 133 cubic feet of air.

CAUSES OF COAL DUST EXPLOSIONS.

The more common means by which coal dust in the air may be ignited and start an explosion in a coal mine are as follows: The flame from a shot or the accidental ignition of an explosive in the open; an explosion of a small body of fire damp; and, more rarely, an electric arc or glowing wire or even the flame of an open lamp.

SHOTS OR BLASTS.

The long flame from a shot of black powder has been the commonest cause of coal-dust explosions in mines in this country. Blown-out shots have started many, and it is a common belief that the flame of black powder must come from a blown-out shot to start a dust explosion. This belief is not supported by the facts, for explosions have started from shots that were not blown out, nor even overcharged. It is certain, also, that if the air at the face contains even a small percentage of gas (methane), the flame from even a properly placed and charged shot of black powder may start a dust explosion. The danger is greatest when several shots in the same working place are fired at the same time. The dust made by a shot, and any gas distilled from the coal by the heat, may be set on fire by the flame of the next shot.

Dynamite is fully as dangerous as black powder. It is quicker than powder, but gives a long hot flame, and many explosions have been traced to its use. Miners have been known to put two explosives, like black powder and dynamite, in the same hole. Such a combination is more dangerous than either explosive used alone. If the quicker-burning explosive is placed at the outer end of the charge it may blow out the stemming; if it is placed at the bottom of the hole it may blow the slower explosive while still burning into the dust raised by the shot.

DANGER FROM TAMPING WITH COAL DUST.

The chance of a shot of some long-flame explosive like black powder or dynamite starting a dust explosion is fearfully increased if the shot is tamped with coal dust or fine coal. Sometimes miners wet the dust or machine cuttings used for stemming in the belief that they can thus keep it from being ignited. There is little ground for this belief. If the shot is blown out, its heat instantly drives off the water, and then sets fire to the cuttings. Experiments at Pittsburg have shown that if the coal-dust stemming is wet it gives a flame only a litle shorter than if dry. When 2.5 pounds of black powder and 2.6 pounds of coal-dust stemming were used in a cannon the flame with dry stemming was 64 feet long and with wet stemming 50 feet long. With heavier charges the flames would probably have been longer.

Sometimes miners use pieces of coal of nut size for stemming in the belief that they lessen the danger in this way. It is clear, however, that ramming or tamping such pieces will crush them, and that the shot will break the pieces still finer and perhaps ignite them.

FIRE DAMP.

Explosions of fire damp have ranked next to the use of long-flame explosives as a cause of dust explosions. Methane is given off more or less from nearly all coals, although most coal mines in the United States do not make enough methane to be called gaseous. A great many of them make a little methane, but so little that the return air currents carry under 0.5 per cent, a quantity too small to be detected with a good safety lamp. But if a mine is dry and dusty, and long-flame explosives like black powder are used, the presence of a small percentage of methane greatly increases the chance of an extensive dust explosion. Moreover, in those mines in which methane comes from the coal seam, the percentage in the mine air is usually larger at the working faces; and it is "at the face" that many explosions start.

If methane comes from the floor or from the roof, it is likely to collect in the gob, or where there have been falls of roof, or in places where the air currents do not circulate. In a well-ventilated mine any body of fire damp is likely to be small, and if it is ignited there is little chance of the explosion spreading far unless dry coal dust is at hand. Therefore, if a mine makes any methane at all, great care should be taken to keep down the coal dust in all the workings.

MOISTURE IN MINE AIR.

MOISTURE NEEDED TO RENDER COAL DUST INERT.

Experiments at the Pittsburg station and the examination of coal mines after explosions have indicated that if the coal dust in any part of a mine is so damp that every sample of it that may be gathered sticks together when pressed in the hand, there is little or no danger of a dust explosion starting in that part of the mine. To be so damp as this, the dust must hold moisture to the extent of at least one-third of its own weight. The added moisture tends to keep the dust from taking fire in two ways: (1) The moist dust must be dried before it will flame, and the drying takes heat, so more heat or a larger flame is needed to ignite wet dust than dry dust; (2) moistened dust settles to the floor and packs there or sticks to the walls and roof. In case of a shock to the mine air no dust cloud can form to spread a flame.

RELATIVE HUMIDITY.

When air contains all the water in the form of vapor it can hold it is said to be saturated. Water vapor can not be seen, but air that is saturated with water vapor can carry more water as fog or mist.

Relative humidity means the quantity of water vapor in the air compared with the quantity the air would hold if saturated, and this relation is expressed as a percentage. When the air at any place is saturated with water vapor the relative humidity is 100 per cent; when the air is half saturated the relative humidity is 50 per cent.

The amount of water vapor needed to saturate air depends chiefly on temperature. Warm air can carry much more water than cold air.

MOISTURE CARRIED BY VENTILATING CURRENTS.

To get an idea of the way which the change from winter to summer affects mine air, assume that in winter the temperature ouside a mine is 0° F. and the relative humidity is 70 per cent. By reckoning from the figures given in dew-point tables, it can be shown that under these conditions each 100,000 cubic feet of air carries into the mine a little over half a gallon of water. Therefore, an intake of 100,000 cubic feet of air per minute would carry into the mine about 750 gallons of water a day. In summer, with a temperature of 80° F. and a relative humidity of 70 per cent out-

side the mine, a current of 100,000 cubic feet per minute would carry into the mine 13.1 gallons of water per minute or 19,000 gallons every 24 hours—that is, 23 times as much as under the assumed winter conditions.

The average temperature of most coal mines in this country is between 55° and 70° F., except near the intakes. The winter temperature of a mine differs only a few degrees from the summer temperature, because the temperature of the ground changes very little and the intake air takes the temperature of the walls of the mines.

A peculiar fact, noted by the mining engineers of the Bureau of Mines and by others, is that the relative humidity of the main return air current of the mine is nearly always over 90 per cent, no matter what the relative humidity of the outside air may be. The average relative humidity in the returns of coal mines, as shown by many measurements made under the direction of this bureau, is 90.5 per cent. A lower relative humidity in the returns is found in those Rocky Mountain regions where the air outside the mines is dry nearly all the time.

Now, assume that the average temperature of a mine is 60° F., and that the relative humidity in the return is 90 per cent. Then every 100,000 cubic feet of air of the return carries 8.9 gallons of water out of the mine. (This can be shown by figuring from dew-point tables.) On a winter day, when the temperature is 0° F. and the relative humidity is 70 per cent outside the mine, every 100,000 cubic feet of air entering the mine carries in about 0.6 gallon of water; and hence every 100,000 cubic feet of air leaving the mine carries out 8.3 gallons more. Consequently, if conditions do not change at all for 24 hours the current will take from the mine in that time 11,952 gallons of water more than it carries in. Observations in many mines in different coal fields in March and April, 1908, indicated that even in the spring months the average excess of water taken out of each mine in 24 hours was 5,657 gallons.

On the other hand, in summer time, with an average temperature of 80° F. and a relative humidity of 70 per cent outside a mine, the intake current carries 13.1 gallons of water in each 100,000 cubic feet of air. If the temperature of the return is 60° F. and its relative humidity is 90 per cent, there are carried out of the mine 8.9 gallons of water per 100,000 cubic feet of air; hence there will be carried into the mine with each 100,000 cubic feet of air 4.2 gallons of water more than are carried out, and the water deposited in the mine will amount in 24 hours to 6,048 gallons.

The water brought in is deposited on the sides, roof, and floor of the intake airways; it makes the main airway wet near the entrance, and generally some of it collects there. At the beginning of warm weather the moisture does not extend into the mine, but as summer advances the moisture works in farther and farther until the workings are all so damp that the danger of an explosion is much lessened.

On the other hand, in winter time water is taken from the mine, and unless this water is replaced by spraying or some other method the walls and the roof of the passageways and the dust along the roads will be dried by the ventilating current.

Nearly all coal mines in the United States were formerly allowed to remain dry and dusty in the winter, and a great many are not kept damp today. It is true that in most bituminous and lignite mines some artificial watering has been done, but as a rule this watering has not sufficed to replace the water taken out by the air. In the last two years, however, there has been a great improvement in dust-laying methods, and now many mines are systematically dampened.

PREVENTION OF COAL-DUST EXPLOSIONS.

The chance of a coal-dust explosion can be much reduced by care in using explosives. It can be reduced still more by using what are known as permissible explosives—explosives that have passed certain tests by the Bureau of Mines. If these explosives are always used under the conditions prescribed by the bureau, there is little danger of their igniting dust.

The pressure of a small or large body of methane, the inflammation of which is an important cause in starting dust explosions, can be prevented by thorough ventila-

tion. Many mine operators are satisfied if they send large volumes of air into a mine. At some mines more air enters than is really needed, but not enough reaches the working places to sweep the face or to keep the gob free from inflammable gas.

Leaky stoppings, overcasts, and doors are responsible for the loss of air. A bad error in most coal mines in this country is the use of a single ventilating door in places where double or triple doors would prevent part of the loss of the ventilating current.

It is evident that although the making of dust in coal mines can not be stopped, there are ways of keeping down the quantity of dust. It is also clear that although any bituminous coal or lignite mine that is dry is liable to have a dust explosion, the chances of such an explosion can be greatly lessened. To entirely prevent dust explosions is more difficult, but they can be prevented by carrying out measures to keep the dust from igniting and to keep it in such condition that it can not spread an explosion.

There are two ways of keeping coal dust from being dangerous. One is to wet it; the other is to mix or cover it with rock or shale dust, clay, or sand. If the coal dust is wet enough it will not ignite; if there is enough unburnable dust mixed with it, a flame will not spread.

MOISTENING THE AIR CURRENT.

The simplest method of keeping a mine damp is to put moisture into the ventilating current; then the air going through the mine does not dry the dust but carries moisture to it. There are two ways of putting moisture into mine air. One is by using fixed sprays of water placed at intervals through the mine; the other is by moistening the intake air at the mouth of the mine.

PRECAUTIONS.

In a mine working coal that makes inflammable dust, the risk of a dust explosion can be greatly lessened by following these precautions:

Use permissible explosives where the coal can not be wedged down; and use them in the ways suggested by the Bureau of Mines in Miners' Circular 2.

Don't use black powder, dynamite, or any long-flame explosive.

Use permissible explosives where the coal can not be wedged down.

Don't blast the coal "off the solid." Undercut it or shear it, and wedge it down if possible.

Don't drill the holes beyond the undercutting or shearing.

Don't fire two shots at once, except by electricity from outside the mine. Allow enough time between shots for the dust to settle.

When shots throughout a mine are fired after the shift by shot-firers, *they should be fired on the last of the air first, then successively toward the intake,* so that the dust and gases from the earlier shots will not be carried towards and possibly *ignited* by the later shots.

Don't tamp shots with coal dust, bug dust, or small coal, whether wet or dry. Use clay or other material that will not flame.

Load out all coal dust or bug dust from the working places and do not let it collect along the roads. It is dangerous in the mine; it has value as fuel outside.

Use tight cars and keep the coal below the sides of the cars.

Flush the tops of the loads with sprays.

Remember that a dry mine is a dangerous mine.

Wash the coal dust from the roof, ribs, and timbers; or, if this is not done, keep the dust *damp* by making the mine "sweat" all winter as it does in summer; or else keep the coal dust *covered with rock dust, clay, or similiar material.*

Don't be satisfied with having some parts of the mine wet.

Keep all the mine wet, so wet that the roof and sides are beaded with moisture and the dust packs down on the floor and *looks wet.*

IMPORTS AND EXPORTS IN 1910.

The imports of coal entered for consumption in the United States in 1910 amounted to 1,991,943 short tons of bituminous, valued at $5,381,062.

The exports of coal amounted to 3,021,627 short tons of anthracite, valued at $14,785,387, and 10,784,239 short tons of bituminous, valued at $26,685,405. Anthracite coal is admitted free, while the bituminous coal pays duty.

FINANCIAL STATEMENT

The following table shows all revenues accruing to the State by virtue of the provisions of the mining laws, and of all disbursements, during 1910 by months, accounts and amounts.

Total amount accruing to the State on account of mine inspections.....$2,795 00
Total amount accruing to the State on account of mine foreman examinations. 225 00

Total revenue.....$3,020 00

Total disbursements from January 1, 1910, to December 31, 1910, inclusive.

ACCOUNTS	Months and Amounts						
	Jan.	Feb.	March	April	May	June	July
Salaries:							
Chief Mine Inspector	$ 200.00	$ 200.00	$200.00	$ 200.00	$ 200.00	$ 200.00	$ 200.00
Dist. Inspector, East Div.	141.66	141.66	141.66	141.66	141.66	141.66	141.66
Dist. Inspector, Middle Div.	141.66	141.66	141.66	141.66	141.66	141.66	141.66
Dist. Inspector&Statistician	141.66	141.66	141.66	141.66	141.66	141.66	141.66
Clerk	125.00	125.00	125.00	125.00	125.00	125.00	125.00
Traveling Expenses:							
Chief Mine Inspector	104.10	128.05	108.25	67.20	105.64	102.25	82.95
Dist. Inspector, East Div.	29.95	49.80	49.67	44.75	58.67	67.70	59.75
Dist. Inspector, Middle Div.	42.45	46.75	82.90	72.12	91.14	71.41	26.53
Dist. Inspector&Statistician		32.65	16.40	19.71			
Office expenses,sta.,blanks, etc	110.25	122.60	59.25	84.05	99.42	24.45	100.90
Postage		10.00		80.00			
Mine Inspectors Supplies	78.85	13.50	12.00	28.85	33.71	65.10	
Furniture and Fixtures			115.00				
Mine Foreman Examinations				93.05			
Total	$1,115.58	$1,153.33	$1,193.45	$1,239.71	$1,138.56	$1,080.89	$1,020.11

ACCOUNTS	Months and Amounts					Grand Total
	Aug.	Sept.	Oct.	Nov.	Dec.	
Salaries:						
Chief Mine Inspector	$ 200.00	$200.00	$ 200.00	$200.00	$ 200.00	$ 2,400.00
District Inspector, East Division	141.66	141.66	141.66	141.66	141.66	1,699.92
District Inspector Middle Division	141.66	141.66	141.66	141.66	141.66	1,699.92
District Inspector & Statistician	141.66	141.66	141.66	141.66	141.66	1,699.92
Clerk	125.00	125.00	125.00	125.00	125.00	1,500.00
Traveling Expenses:						
Chief Mine Inspector	78.10	106.15	89.40	76.10		1,048.19
District Inspector, East Division	44.40	49.55	59.80	54.50	55.20	623.74
District Inspector, Middle Division	82.65	46.95	78.68	40.28	16.90	698.76
District Inspector and Statistician			8.80			77.56
Office expenses, sta., blanks, etc	22.50	10.60	19.30	55.00	35.07	743.39
Postage					60.00	150.00
Mine Inspectors Supplies			31.80			263.81
Furniture and Fixtures						115.00
Mine Foreman Examinations			27.50			120.55
Printing					600.00	600.00
Total	$ 977.63	$963.23	$1,065.26	$975.86	$1,517.15	$13,440.76

MINE INSPECTIONS IN 1910, IN DETAIL

The following table shows all mine inspections in 1910 in detail, giving fees due the State from each operator as provided by law:

Mine inspections in 1910 *in detail*

OPERATORS		MINES		FEE	TOTAL FEES
COUNTY AND NAME	POSTOFFICE	NAME	DATE INSPECTED		
Fentress County					
Fentress Coal & Coke Co.	Wilder	Fentress 1	Jan. 11	$ 35.00	
Fentress Coal & Coke Co.	Wilder	Fentress 1	Dec. 11	25.00	
Fentress Coal & Coke Co.	Wilder	Fentress 3	Dec. 12	15.00	$ 75.00
Grundy County					
Sewanee Fuel & Iron Co.	Coalmont	Coalmont O	June 30	30.00	30.00
Sewell and Stotts	Tracy City	Hampton	June 29	15.00	15.00
Marion County					
Battle Creek Coal & C.Co	Orme	Battle Creek	April 6	35.00	35.00
Tenn. Con. Coal Co	Tracy City	Pryor Ridge 1	June 28	25.00	
Tenn. Con. Coal Co	Tracy City	Pryor Ridge 2	July 28	15.00	40.00
Overton County					
Brier Hill Collieries	Crawford	Brier Hill 1	Jan. 12	20.00	
Brier Hill Collieries	Crawford	Brier Hill 1	Dec. 13	20.00	
Brier Hill Collieries	Crawford	Brier Hill 2	Jan. 12	15.00	
Brier Hill Collieries	Crawford	Brier Hill 2	Dec. 13	15.00	
Brier Hill Collieries	Crawford	Brier Hill 3	Dec. 13	15.00	85.00
Laurel Creek Coal Co	Wilder	Overton	Jan. 11	10.00	10.00
Overton Coal & Coke Co	Davidson	Overton	Dec. 12	20.00	20.00
Total First District				$ 310.00	$ 310.00
Hamilton County					
Montlake Coal Co	Chattanooga	Montlake	June 13	$ 20.00	20.00
New Soddy Coal Co	Chattanooga	Big Soddy A	July 8	15.00	
New Soddy Coal Co	Chattanooga	Big Soddy B	July 8	15.00	
New Soddy Coal Co	Chattanooga	New Soddy 1-2	April 6	35.00	
New Soddy Coal Co	Chattanooga	New Soddy 1-2	July 6	35.00	
New Soddy Coal Co	Chattanooga	New Soddy 3	July 8	20.00	120.00
Morgan County					
Big Brushy Coal & C. Co.	Petros	Big Brushy 1-2	Feb. 3	25.00	
Big Brushy Coal & C. Co.	Petros	Big Brushy 1-2	Aug. 25	25.00	50.00
Bowling Coal Co	Coalfield	Bowling 1	Feb. 12	25.00	
Bowling Coal Co	Coalfield	Bowling 1	April 30	25.00	
Bowling Coal Co	Coalfield	Bowling 1	Oct. 21	25.00	75.00
Harriman Coal Co	Harriman	Harriman	Dec. 20	15.00	15.00
Little Brushy Coal Co	Coalfield	Little Brushy	Jan. 28	20.00	
Little Brushy Coal Co.	Coalfield	Little Brushy	Nov. 14	20.00	40.00
Oliver Coal Co	Oliver Springs	Oliver	Nov. 21	20.00	20.00
Poplar Creek Coal Co	Oliver Springs	Poplar Creek	April 12	20.00	20.00
Prudential Coal Co	Oliver Springs	Prudential	April 14	20.00	
Prudential Coal Co	Oliver Springs	Prudential	Nov 21	20.00	40.00
State of Tennessee	Nashville	Brushy Mt. 3	March 3	35.00	
State of Tennessee	Nashville	Brushy Mt. 3	June 11	35.00	
State of Tennessee	Nashville	Brushy Mt. 3	Aug. 26	35.00	
State of Tennessee	Nashville	Brushy Mt. 3	Oct. 15	35.00	140.00
Rhea County					
Dayton Coal & Iron Co.	Dayton	Prospect	Feb. 5	30.00	
Dayton Coal & Iron Co.	Dayton	Prospect	June 11	30.00	
Dayton Coal & Iron Co.	Dayton	Prospect	Oct. 24	30.00	
Dayton Coal & Iron Co.	Dayton	Richland	June 10	35.00	125.00
Penn. Coal & Lumber Co.	Spring City	Penn	Nov. 12	5.00	5.00

Mine inspections in 1910 *in detail—continued.*

OPERATORS		MINES		FEE	TOTAL FEES
COUNTY AND NAME	POSTOFFICE	NAME	DATE INSPECTED		
Roane County					
Roane Iron Co	Rockwood	McLean	Feb. 24	20.00	
Roane Iron Co	Rockwood	Old	Feb. 16-17	35.00	
Roane Iron Co	Rockwood	Old	June 6-8	35.00	90.00
Treat Coal Co.	Harriman	Treat	Nov. 21	20.00	20.00
Scott County					
Wolford Phillips	Laxton	Paint Rock 3	Dec 26	15.00	15.00
Virginia Mining Co.	Roberta	Phillips	Oct. 25	15.00	
Virginia Mining Co.	Roberta	West Hollow	Oct. 25	5.00	20.00
Total Second District				$ 815.00	$ 815.00
Anderson County					
Black Diamond Coal Co.	Knoxville	Black Diamond 1	June 27	30.00	
Black Diamond Coal Co.	Knoxville	Black Diamond 5	Jan. 11	35.00	
Black Diamond Coal Co.	Knoxville	Black Diamond 5	June 30	35.00	
Black Diamond Coal Co.	Knoxville	Black Diamond 5	Aug. 31	35.00	$ 135.00
Coal Creek Coal Co	Coal Creek	Fraterville	Jan. 12	25.00	
Coal Creek Coal Co	Coal Creek	Fraterville	Feb. 16	25.00	
Coal Creek Coal Co	Coal Creek	Fraterville	Nov. 14	25.00	
Coal Creek Coal Co.	Coal Creek	Thistle	Jan. 13	30.00	
Coal Creek Coal Co.	Coal Creek	Thistle	Nov. 11	30.00	135.00
Knoxville Iron Co	Knoxville	Cross Mt. 1	Jan. 19	35.00	
Knoxville Iron Co.	Knoxville	Cross Mt. 1	Feb. 7	35.00	70.00
Minersville Coal Co	Piess	Buck Mt	Feb. 17	30.00	
Minersville Coal Co	Piess	Buck Mt	Nov. 4	30.00	60.00
Tennessee Coal Co	Knoxville	Tennessee	Jan. 14	35.00	
Tennessee Coal Co	Knoxville	Tennessee	Dec. 11	35.00	70.00
Windrock Coal Co	Windrock	Windrock 1	April 13	35.00	
Windrock Coal Co	Windrock	Windrock 1	Nov. 22	35.00	70.00
Campbell County					
Anchor Coal Co.	Morley	Anchor	March 2	20.00	20.00
Bear Wallow Coal Co	Caryville	Bear Wallow	Jan. 10	20.00	
Bear Wallow Coal Co	Caryville	Bear Wallow	Oct. 19	20.00	40.00
Block Coal & Coke Co	Block	Block 1-2	April 27	15.00	
Block Coal & Coke Co	Block	Block 3	April 27	10.00	25.00
Blue Gem Coal Co	Jellico	Blue Gem (Speed)	June 9	30.00	30.00
Campbell Coal Min. Co	Westbourne	Jackson	April 5	35.00	35.00
Chaska Coal Co	Chaska	Chaska	March 25	25.00	25.00
Evans Coal Co	Jellico	Evans	June 9	20.00	20.00
Falls Branch Coal Co	Wooldridge	Falls Branch	June 7	30.00	
Falls Branch Coal Co	Wooldridge	Powhattan	June 7	20.00	50.00
Jellico B. G. Coal Co	Jellico	Jellico B. G	Feb. 8	20.00	20.00
Kimberly Coal Co	Cupp	Kimberly	March 25	30.00	30.00
LaFollette C.,I.& Ry.Co	LaFollette	Rex 1	Jan. 27	35.00	
LaFollette C.,I.& Ry.Co	LaFollette	Rex 1	March 23	35.00	
LaFollette C.,I.& Ry.Co	LaFollette	Rex 1	Oct. 24	35.00	
LaFollette C.,I.& Ry.Co	LaFollette	Rex 2	Jan. 28	35.00	
LaFollette C.,I.& Ry.Co	LaFollette	Rex 2	March 24	35.00	
LaFollette C.,I.& Ry.Co	LaFollette	Rex 2	Dec. 19	35.00	210.00
Morley Coal Co	Morley	Morley	March 2	15.00	15.00
Newman Coal Co	Jellico	Newman	June 7	5.00	5.00
Red Ash Coal Co	Caryville	Red Ash	Sept. 10	30.00	30.00
Remy Coal Co	Gatliff	Remy	Feb. 2	30.00	30.00
Rich Mt. Coal Co	Bennett	Rich Mt	April 6	25.00	25.00
Royal Coal & Coke Co	Coal Creek	Cambria	Jan. 7	25.00	
Royal Coal & Coke Co	Coal Creek	Cambria	Feb. 10	25.00	
Royal Coal & C. Co	Coal Creek	Cambria	June 20	25.00	

Mine inspections in 1910 *in detail—continued.*

OPERATORS		MINES		FEE	TOTAL FEES
COUNTY AND NAME	POSTOFFICE	NAME	DATE INSPECTED		
Campbell County--Con.					
Royal Coal & C. Co	Coal Creek	Cambria	Nov. 2	25.00	$ 100.00
Tenn.-Jellico Coal Co	Anthras	Tenn-Jellico	Aug. 23	35.00	35.00
Westbourne Coal Co	Westbourne	Westbourne	April 5	30.00	30.00
Wooldridge-Jel. Coal Co.	Wooldridge	Marion-Anna	June 8	35.00	35.00
Wynn Coal Co	Gatliff	Wynn	Aug. 22	25.00	
Wynn Coal Co	Gatliff	Wynn	Dec, 15	25.00	50.00
Claiborne County					
Bryson Mt. Coal & C. Co.	Hartranft	Bryson Mt 1	March 17	30.00	30.00
King Mt. Coal Co	Clairfield	King Mt	Feb. 7-8	20.00	20.00
Nicholson Coal Co	Nicholson	Nicholson 2	May 10	20.00	
Nicholson Coal Co	Nicholson	Nicholson 3	May 10	25.00	45.00
Pruden Coal Co	Pruden	Pruden	July 19	35.00	35.00
Reliance Coal & C. Co	Hartranft	Reliance 1-2	March 16	35.00	35.00
Sterling Coal & Coke Co	Manring	Sterling 1-2	March 16	35.00	35.00
Yellow Creek Coal Co	Bosworth, Ky	Yellow Creek 2	May 10	35.00	35.00
Total Third District				$ 1,635.00	$ 1,635.00
Total fees due the State from all Coal Mine Inspections in 1910				$ 2,760.00	$ 2,760.00

COPPER MINE INSPECTIONS IN 1910

OPERATORS		MINES		FEE	TOTAL FEES
COUNTY AND NAME	POSTOFFICE	NAME	DATE INSPECTED		
Polk County					
Tennessee Copper Co	Copperhill	Burra Burra	May 25-26	$ 35.00	$ 35.00
Total fees due the State from all Copper Mine Inspections in 1910				$ 35.00	$ 35.00
Grand total fees due the State from all Mine Inspections in 1910				$2,795.00	$2,795.00

COAL MINES IN TENNESSEE JANUARY 1, 1911

This table gives name and location of coal mines in Tennessee, January 1, 1911, with name and postoffice address of Superintendents arranged alphabetically by counties and mines:

Name and postoffice address of coal mines and superintendents in Tennessee, January 1, 1911.

MINE			SUPERINTENDENT		
No.	County and Name	Postoffice	No.	County and Name	Postoffice
	Anderson County			*Anderson County*	
1	Andys Ridge	Briceville	1	W. A. Keith	Briceville
2	Black Diamond 1	Coal Creek	2	L. F. Card	Coal Creek
3	Black Diamond 5	Coal Creek	3	L. F. Card	Coal Creek
4	Black Diamond 6	Briceville	4	John Jeffreys, Sr	Briceville
5	Brookside	Pless	5	John W. Goans	Pless
6	Buck Mountain	Pless	6	John W. Goans	Pless
7	Cross Mountain 1	Briceville	7	P. F. Lynch	Briceville
8	Cross Mountain 3	Briceville	8	P. F. Lynch	Briceville
9	Eureka 2	Pless	9	John W. Goans	Pless
10	Fraterville 1	Coal Creek	10	G. M. Camp	Coal Creek
11	Middle Ridge	Briceville	11	E. F. Buffat	Briceville
12	Piedmont 2	Oliver Springs	12	James Williams	Oliver Springs
13	Piedmont 4	Oliver Springs	13	James Williams	Oliver Springs
14	Taft	Coal Creek	14	G. M. Camp	Coal Creek
15	Tennessee	Briceville	15	E. F. Buffat	Briceville
16	Thistle	Coal Creek	16	G. M. Camp	Coal Creek
17	Windrock	Windrock	17	W. G. Srodes	Windrock
	Bledsoe County			*Bledsoe County*	
18	Atpontley 2	Atpontley	18	C. B. Finley	Atpontley
19	Atpontley 6	Atpontley	19	C. B. Finley	Atpontley
	Campbell County			*Campbell County*	
20	Anchor	Morley	20	H. W. Smith	Morley
21	Baird Blue Gem	Elk Valley	21	Lewis Baird	Elk Valley
22	Bear Wallow	Caryville	22	A. H. Bowling	Caryville
23	Big Block	Cupp	23	J. Z. Marshall	LaFollette
24	Block 2	Block	24	J. P. Gorman	Block
25	Block 3	Block	25	J. P. Gorman	Block
26	Blue Gem (Speed)	Jellico	26	J. F. Macpherson	Jellico
27	Cambria	Coal Creek	27	W. A. Pless	Coal Creek
28	Caryville	Caryville	28	J. H. McManaman	Caryville
29	Chaska 1	Chaska	29	W. M. Sexton	Chaska
30	Chaska 3	Chaska	30	W. M. Sexton	Chaska
31	Davis Creek 1	Cupp	31	I. Livingston	Cupp
32	Davis Creek 2	Cupp	32	I, Livingston	Cupp
33	Elk Hart, B. G.	Elk Valley	33	J. F. Baird	Elk Valley
34	Elk Valley	Elk Valley	34	D. W. Parrott	Elk Valley
35	Evans	Jellico	35	P. F. Gorman	Jellico
36	Falls Branch	Wooldridge	36	W. Dinkelaker	Wooldridge
37	Gem	Peabody	37	James Wynn	Peabody
38	Indian Mt. 1	Jellico	38	Philip Francis	Jellico
39	Indian Mt. 2	Jellico	39	Philip Francis	Jellico
40	Italian, B. G	Newcomb	40	Thomas Zechini	Newcomb
41	Italy	Cupp	41	Thomas Zechini	Newcomb
42	Jackson	Westbourne	42	W. H. Sienknecht	Westbourne
43	Jellico, B. G	Jellico	43	H. M. Jones	Jellico
44	Jellico Cannel	Newcomb	44	Thomas Zechini	Newcomb

Coal mines and superintendents in Tennessee, January 1, 1911—continued.

No.	MINE		No.	SUPERINTENDENT	
	COUNTY AND NAME	POSTOFFICE		COUNTY AND NAME	POSTOFFICE
	Campbell County—Con.			*Campbell County—Con.*	
45	Kimberly	Cupp	45	F. D. French	Cupp
46	Marion-Anna	Wooldridge	46	William Dinkelaker	Wooldridge
47	Morley	Morley	47	J. C. Kranz	Morley
48	Newman	Jellico	48	A. T. Newman	Jellico
49	Powhattan	Wooldridge	49	William Dinkelaker	Wooldridge
50	Red Ash	Caryville	50	T. D. Richards	Caryville
51	Remy	Gatliff	51	J. D. Wheeler	Gatliff
52	Rex 1	LaFollette	52	H. Berin	LaFollette
53	Rex 2	LaFollette	53	Charles Hoebel	LaFollette
54	Rich Mountain 1	Bennett	54	H. W. Tillery	Bennett
55	Rock Spring	Turley	55	G. W. Card	Coal Creek
56	Southern 1	Gatliff	56	J. C. Babb	Gatliff
57	Southern 2	Gatliff	57	J. C. Babb	Gatliff
58	Sun	Caryville	58	J. H. Bowling	Caryville
59	Tenn.-Jellico	Anthras	59	John P. Gorman	Anthras
60	Westbourne 1-2	Westbourne	60	W. H. Sienknecht	Westbourne
61	Westbourne 3	Westbourne	61	W. H. Sienknecht	Westbourne
62	Whistle Creek	Newcomb	62	Alex Ross	Newcomb
63	Woodward	Jellico	63	C. M. Woodward	Jellico
64	Wooldridge	Wooldridge	64	William Dinkelaker	Wooldridge
65	Wynn	Gatliff	65	Harry Wynn	Gatliff
66	Zechini	Newcomb	66	Thomas Zechini	Newcomb
	Claiborne County			*Claiborne County*	
67	Bryson Mt. 1	Hartranft	67	A. L. Adams	Hartranft
68	Bryson Mt. 2	Hartranft	68	A. L. Adams	Hartranft
69	Buffalo	Eagan	69	J. B. Cunningham	Eagan
70	Fork Ridge 1 F	Fork Ridge	70	A. H. Rennebaum	Fork Ridge
71	Fork Ridge 2 S	Fork Ridge	71	A. H. Rennebaum	Fork Ridge
72	Fork Ridge 3	Fork Ridge	72	A. H. Rennebaum	Fork Ridge
73	King Mountain	Clairfield	73	N. L. Reynolds	Clairfield
74	Mingo 1	Hartranft	74	R. L. Ralston	Hartranft
75	Mingo 2	Hartranft	75	R. L. Ralston	Hartranft
76	Mingo 3	Hartranft	76	R. L. Ralston	Hartranft
77	Mingo 5	Hartranft	77	R. L. Ralston	Hartranft
78	New Jellico	Clairfield	78	Richard Rigby	Clairfield
79	Nicholson 2	Nicholson	79	E. R. Short	Nicholson
80	Nicholson 3	Nicholson	80	E. R. Short	Nicholson
81	Pruden	Pruden	81	G. M. Wallen	Pruden
82	Reliance 1-2	Hartranft	82	J. B. Robinson	Hartranft
83	Reliance 3	Hartranft	83	J. B. Robinson	Hartranft
84	Standard	Clairfield	84	G. T. Spencer	Clairfield
85	Sterling 1-2	Manring	85	W. H. Finley	Manring
86	Yellow Creek 2	Bosworth, Ky.	86	J. F. Bosworth	Bosworth, Ky.
87	Yellow Creek 3	Bosworth, Ky.	87	J. F. Bosworth	Bosworth, Ky.
	Cumberland County			*Cumberland County*	
88	Clear Creek 1	Isoline	88	S. L. Winborger	Isoline
89	Clear Creek 5	Isoline	89	S. L. Winborger	Isoline
90	Fall Creek	Ozone	90	E. G. Tollett, Rec	Crossville
91	Renfro	Ozone	91	T. W. Gould	Ozone r f d
92	Waldensia	Waldensia	92	R. Ellison	Waldensia
	Fentress County			*Fentress County*	
93	Fentress 1	Wilder	93	Joseph Cain	Wilder
94	Fentress 2	Wilder	94	Joseph Cain	Wilder
	Grundy County			*Grundy County*	
95	Clouse Hill 1-2	Tracy City	95	J. M. Sehorn	Coalmont
96	Coalmont B	Coalmont	96	H. S. Walden	Coalmont

Coal mines and superintendents in Tennessee, January 1, 1911—continued.

No.	MINE		No.	SUPERINTENDENTS	
	County and Name	Postoffice		County and Name	Postoffice
	Grundy County—Con.			*Grundy County—Con.*	
97	Coalmont H	Coalmont	97	H. S. Walden	Coalmont
98	Coalmont O	Coalmont	98	H. S. Walden	Coalmont
99	East Fork	Tracy City	99	R. B. Roberts	Tracy City
100	East Staub	Tracy City	100	R. B. Roberts	Tracy City
101	Ferguson	Coalmont	101	J. A. Harrison	Coalmont
102	Flat Branch	Meeks	102	W. S. Orange	Meeks
103	Hampton	Tracy City	103	W. H. Hampton	Tracy City
104	Henley	Tracy City	104	R. B. Roberts	Tracy City
105	Lone Rock	Tracy City	105	R. B. Roberts	Tracy City
106	Nunley	Tracy City	106	R. B. Roberts	Tracy City
107	Ramsey 1	Tracy City	107	R. B. Roberts	Tracy City
108	Ramsey (West)	Tracy City	108	R. B. Roberts	Tracy City
109	Reid Hill 1	Tracy City	109	R. B. Roberts	Tracy City
110	Street Hill	Tracy City	110	R. B. Roberts	Tracy City
111	Werner	Tracy City	111	R. B. Roberts	Tracy City
	Hamilton County			*Hamilton County*	
112	Alexander	Daisy	112	T. A. Alexander	Daisy
113	Big Soddy A	Soddy	113	Robert Pettigrew	Chattanooga
114	Big Soddy B	Soddy	114	Robert Pettigrew	Chattanooga
115	Big Soddy 1	Soddy	115	Robert Pettigrew	Chattanooga
116	Big Soddy 2	Soddy	116	Robert Pettigrew	Chattanooga
117	Big Soddy 3	Soddy	117	Robert Pettigrew	Chattanooga
118	Big Soddy 4	Soddy	118	Robert Pettigrew	Chattanooga
119	Big Soddy 7	Soddy, r.f.d.2	119	Robert Pettigrew	Chattanooga
120	Montlake	Montlake	120	W. E. Brinkerhoff	Montlake
121	Sale Creek	Sale Creek	121	Robert Pettigrew	Chattanooga
122	Soddy 1-2	Soddy	122	Robert Pettigrew	Chattanooga
123	Soddy 4	Soddy	123	Robert Pettigrew	Chattanooga
124	Soddy 5	Soddy	124	Robert Pettigrew	Chattanooga
125	Soddy 9	Soddy	125	Rodert Pettigrew	Chattanooga
126	Soddy 10	Soddy	126	Robert Pettigrew	Chattanooga
	Marion County			*Marion County*	
127	Battle Creek	Orme	127	W. McIntyre, Sr.	Orme
128	New Etna 1	Whiteside	128	Thomas Degnan	Whiteside
129	New Etna 2	Whiteside	129	C. A. Hall	Whiteside
130	New Etna 4	Whiteside	130	Thomas Degnan	Whiteside
131	New Etna 5	Whiteside	131	J. C. Higdon	Roope
132	Pryor Ridge 1	Tracy City	132	R. B. Roberts	Tracy City
133	Pryor Ridge 2	Tracy City	133	R. B. Roberts	Tracy City
134	Tenn. River	South Pittsburg	134	G. H. Crozer	South Pittsburg
135	Thomas 1-2	Whitwell	135	T. G. Fear	Whitwell
136	Thomas 5	Whitwell	136	T. G. Fear	Whitwell
	Morgan County			*Morgan County*	
137	Babahatchie	Oakdale	137	W. D. Kelly	Rockwood
138	Baker	Coalfield	138	C. N. Baker	Coalfield
139	Big Brushy 1-2	Petros	139	W. S. Wood	Petros
140	Big Mountain	Oliver Springs	140	Charles Livingston	Oliver Springs
141	Bowling 1	Coalfield	141	G. W. Card	Coalfield
142	Brushy Mt. 1	Petros	142	A. W. Evans	Petros
143	Brushy Mt. 3	Petros	143	A. W. Evans	Petros
144	Fagan	Blue Gem	144	J. A. Fagan	Blue Gem
145	Fairchild	Sunbright	145	W. G. Fairchild	Mill Creek
146	Fritts, J. W	Oliver Springs	146	J. W. Fritts	Oliver Springs
147	Harriman	Harriman	147	E. F. Blizzard	Harriman
148	Jackson	Oliver Springs	148	Thomas Jackson	Oliver Springs
149	Little Brushy	Coalfield	149	H. B. Bowling	Coalfield

Coal mines and superintendents in Tennessee, January 1, 1911—continued.

No.	MINE		No.	SUPERINTENDENT	
	County and Name	Postoffice		County and Name	Postoffice
	Morgan County—con.			*Morgan County—con.*	
150	Mount Carbon	Oliver Springs	150	R. P. Walls	Oliver Springs
151	Oliver	Oliver Springs	151	J. R. Richards	Oliver Springs
152	Poplar Creek	Oliver Springs	152	W. W. Leach	Oliver Springs
153	Prudential 1	Oliver Springs	153	J. K. Butler	Oliver Springs
154	Prudential 2	Oliver Springs	154	J. K. Butler	Oliver Springs
155	Reed	Oliver Springs	155	H. B. Downing	Oliver Springs
	Overton County			*Overton County*	
156	Brier Hill 1	Crawford	156	E. B. Taylor	Crawford
157	Brier Hill 2	Crawford	157	E. B. Taylor	Crawford
158	Obey City	Obey City	158	A. D. Eatherly	Obey City
159	Overton	Davidson	159	A. G. Norrod	Davidson
160	Peacock 4-5	Obey City	160	J. C. Lusk	Obey City
	Rhea County			*Rhea County*	
161	Fox 1	Graysville	161	Robert Pettigrew	Chattanooga
162	Fox 2	Graysville	162	Robert Pettigrew	Chattanooga
163	Fox 3	Graysville	163	Robert Pettigrew	Chattanooga
164	Penn	Spring City	164	F. H. Enwright	Spring City
165	Prospect	Dayton	165	Nash Holden	Dayton
166	Richland	Dayton	166	Nash Holden	Dayton
	Roane County			*Roane County*	
167	McLean	Arbutus	167	J. M. Richards	Arbutus
168	Old	Rockwood	168	W. J. Richards	Rockwood
169	Treat	Emory Gap	169	W. McDaniel	Emory Gap
	Scott County			*Scott County*	
170	Baker	Newland	170	Van D. Sparks	Newland
171	Coffee	Laxton	171	George Coffee	Laxton
172	Glen Mary 2-4	Glen Mary	172	Gus Carter	Glen Mary
173	Glen Mary 5	Glen Mary	173	Gus Carter	Glen Mary
174	Lehigh 5	Helenwood	174	B. A. Treat, Rec	Harriman
175	Lehigh 6	Helenwood	175	B. A. Treat, Rec	Harriman
176	LeMoyne	Isham	176	J. C. Walker	Silerville, Ky.
177	Oneida	Oneida	177	J. M. Terry	Oneida
178	Paint Rock 1	Oneida	178	R. A. Woods	Oneida
179	Paint Rock 2	Oneida	179	R. A. Woods	Oneida
180	Paint Rock 3	Laxton	180	Wolfford Phillips	Laxton
181	Pnillips	Roberta	181	J. B. Craig	Roberta
182	Pine Knot	Laxton	182	Jerry Connor	Laxton
183	Southern Clay	Robbins	183	R. M. Ashby	Robbins
184	Stanley	Oneida r f d	184	J. Elswick	Oneida r f d
185	West Hollow	Roberta	185	J. B. Craig	Roberta
186	Workman	Laxton	186	J. C. Mahley	Laxton
	Sequatchie County			*Sequatchie County*	
187	Douglass 2	Dunlap	187	John M. Smith	Dunlap
	White County			*White County*	
188	Bon Air (Shaft)	Bon Air	188	W. F. Dibrell	Bon Air
189	Bon Air 6	Bon Air	189	W. F. Dibrell	Bon Air
190	Clifty Creek 1	Clifty	190	C. W. Bell	Clifty
191	Clifty Creek 3	Clifty	191	C. W. Bell	Clifty
192	Eastland 1	Eastland	192	George Thom, Sr	Eastland
193	Eastland 2	Eastland	193	George Thom, Sr	Eastland
194	Ravenscroft	Ravenscroft	194	W. D. Hardeman	Ravenscroft

COAL MINE OPERATORS IN TENNESSEE, JANUARY 1, 1911

This table gives name and post office address of all coal mine operators in Tennessee, January 1, 1911, arranged alphabetically by districts, counties and operators, and name and location of mines.

Name and postoffice address of coal mine operators in Tennessee. January 1, 1911.

No.	OPERATOR		No.	MINE	
	County and Name	Postoffice		County and Name	Postoffice
	Bledsoe County			*Bledsoe County*	
1	Atpontley Coal Co	Atpontley	1	Atpontley 2	Atpontley
	Atpontley Coal Co	Atpontley	2	Atpontley 6	Atpontley
	Cumberland County			*Cumberland Co.*	
2	Clear Creek Coal & L. Co	Isoline	3	Clear Creek 1	Isoline
	Clear Creek Coal & L. Co	Isoline	4	Clear Creek 5	Isoline
3	Fall Creek Collieries	Ozone	5	Fall Creek	Ozone
4	Renfro Coal & Coke Co	Ozone r f d	6	Renfro	Ozone r f d
5	Waldensia Coal & Coke Co	Waldensia	7	Waldensia	Waldensia
	Fentress County			*Fentress County*	
6	Fentress Coal & Coke Co	Wilder	8	Fentress 1	Wilder
	Fentress Coal & Coke Co	Wilder	9	Fentress 2	Wilder
	Grundy County			*Grundy County*	
7	Ferguson & Harrison	Coalmont	10	Ferguson	Coalmont
8	Flat Branch Coal Co	Meeks	11	Flat Branch	Meeks
9	W. H. Hampton	Tracy City	12	Hampton	Tracy City
10	Sewanee Fuel & Iron Co	Coalmont	13	Clouse Hill 1-2	Tracy City
	Sewanee Fuel & Iron Co	Coalmont	14	Coalmont B	Coalmont
	Sewanee Fuel & Iron Co	Coalmont	15	Coalmont H	Coalmont
	Sewanee Fuel & Iron Co	Coalmont	16	Coalmont O	Coalmont
11	Tenn. Con. Coal Co	Tracy City	17	East Fork	Tracy City
	Tenn. Con. Coal Co	Tracy City	18	East Staub	Tracy City
	Tenn. Con. Coal Co	Tracy City	19	Henley	Tracy City
	Tenn. Con. Coal Co	Tracy City	20	Lone Rock	Tracy City
	Tenn. Con. Coal Co	Tracy City	21	Nunley	Tracy City
	Tenn. Con. Coal Co	Tracy City	22	Ramsey 1	Tracy City
	Tenn. Con. Coal Co	Tracy City	23	Ramsey West	Tracy City
	Tenn. Con. Coal Co	Tracy City	24	Reid Hill 1	Tracy City
	Tenn. Con. Coal Co	Tracy City	25	Street Hill	Tracy City
	Tenn. Con. Coal Co	Tracy City	26	Werner	Tracy City
	Marion County			*Marion County*	
12	Battle Creek Coal Co	Orme	27	Battle Creek	Orme
13	New Etna Coal Co	Chattanooga	28	New Etna 1	Whiteside
	New Etna Coal Co	Chattanooga	29	New Etna 4	Whiteside
	New Etna Coal Co	Chattanooga	30	New Etna 5	Whiteside
	New Etna Coal Co	Chattanooga	31	New Etna 2	Whiteside
14	Nunley Ridge Coal Co	Tracy City	32	Pryor Ridge 1	Tracy City
	Nunley Ridge Coal Co	Tracy City	33	Pryor Ridge 2	Tracy City
15	Tenn. Coal, Iron & Ry. Co	Birmingham, A	34	Thomas 1-2	Whitwell
	Tenn. Coal, Iron & Ry. Co	Birmingham, A	35	Thomas 5	Whitwell
16	Tenn. River Coal Co	So. Pittsburg	36	Tennessee River	South Pittsb'g
	Overton County			*Overton County*	
17	Brier Hill Collieries	Crawford	37	Brier Hill 1	Crawford
	Brier Hill Collieries	Crawford	38	Brier Hill 2	Crawford
18	Obey City Coal Co	Obey City	39	Obey City	Obey City
19	Overton Coal & Coke Co	Davidson	40	Overton	Davidson
20	Peacock Coal Co	Obey City	41	Peacock 4-5	Obey City
	Sequatchie County			*Sequatchie County*	
21	Southern Iron & Steel Co	Birmingham, A	42	Douglass 2	Dunlap

Name and postoffice address of coal mine operators in Tennessee. January 1, 1911—continued.

No.	OPERATOR		No.	MINE	
	County and Name	Postoffice		County and Name	Postoffice
	White County			*White County*	
22	Bon Air Coal & Iron Co	Nashville	43	Bon Air (Shaft)	Bon Air
	Bon Air Coal & Iron Co	Nashville	44	Bon Air 6	Bon Air
	Bon Air Coal & Iron Co	Nashville	45	Eastland 1	Eastland
	Bon Air Coal & Iron Co	Nashville	46	Eastland 2	Eastland
	Bon Air Coal & Iron Co	Nashville	47	Ravenscroft	Ravenscroft
23	Clifty Creek Coal Co	Clifty	48	Clifty Creek 1	Clifty
	Clifty Creek Coal Co	Clifty	49	Clifty Creek 3	Clifty
	Hamilton County			*Hamilton County*	
24	T. A. Alexand er	Daisy	50	Alexander	Daisy
25	Durham Coal & Iron Co	Chattanooga	51	Big Soddy A	Soddy
	Durham Coal & Iron Co	Chattanooga	52	Big Soddy B	Soddy
	Durham Coal & Iron Co	Chattanooga	53	Big Soddy 1	Soddy
	Durham Coal & Iron Co	Chattanooga	54	Big Soddy 2	Soddy
	Durham Coal & Iron Co	Chattanooga	55	Big Soddy 3	Soddy
	Durham Coal & Iron Co	Chattanooga	56	Big Soddy 4	Soddy
	Durham Coal & Iron Co	Chattanooga	57	Big Soddy 7	Soddy
	Durham Coal & Iron Co	Chattanooga	58	Sale Creek	Sale Creek
	Durham Coal & Iron Co	Chattanooga	59	Soddy 1-2	Soddy
	Durham Coal & Iron Co	Chattanooga	60	Soddy 4	Soddy
	Durham Coal & Iron Co	Chattanooga	61	Soddy 5	Soddy
	Durham Coal & Iron Co	Chattanooga	62	Soddy 9	Soddy
	Durham Coal & Iron Co	Chattanooga	63	Soddy 10	Soddy
26	Montlake Coal Co	Chattanooge	64	Montlake	Montlake
	Morgan County			*Morgan County*	
27	Baker Mining Co	Coalfield	65	Baker 1	Coalfield
28	Big Brushy Coal & C Co	Petros	66	Big Brushy 1-2	Petros
29	Big Mt. Coal Co	Oliver Springs	67	Big Mt	Oliver Springs
30	Bowling Coal Co	Coalfield	68	Bowling 1	Coalfield
31	Emory River Coal Co	Rockwood	69	Babahatchie	Oakdale
32	J. A. Fagan	Blue Gem	70	Fagan	Blue Gem
33	G. W. Fairchild	Sunbright	71	Fairchild	Mill Creek
34	J. W. Fritts	Oliver Springs	72	Fritts	Oliver Springs
35	Harriman Coal Co	Harriman	73	Harriman	Harriman
36	Jackson Bros. Coal Co	Oliver Springs	74	Jackson	Oliver Springs
37	Little Brushy Coal Co	Coalfield	75	Little Brushy	Coalfield
38	Mt. Carbon Coal Co	Oliver Springs	76	Mount Carbon	Oliver Springs
39	Oliver Coal Co	Oliver Springs	77	Oliver	Oliver Springs
40	Oliver Spgs. Coal & Clay Co	Oliver Springs	78	Reed	Oliver Springs
41	Poplar Creek Coal Co	Oliver Springs	79	Poplar Creek	Oliver Springs
42	Prudential Coal Co	Oliver Springs	80	Prudential 1	Oliver Springs
	Prudential Coal Co	Oliver Springs	81	Prudential 2	Oliver Springs
43	State of Tennessee	Nashville	82	Brushy Mt. 1	Petros
	State of Tennessee	Nashville	83	Brushy Mt. 3	Petros
	Rhea County			*Rhea County*	
44	Dayton Coal & Iron Co	Dayton	84	Prospect	Dayton
	Dayton Coal & Iron Co	Dayton	85	Richland	Dayton
45	Durham Coal & Iron Co	Chattanooga	86	Fox 1	Graysville
	Durham Coal & Iron Co	Chattanooga	87	Fox 2	Graysville
	Durham Coal & Iron Co	Chattanooga	88	Fox 3	Graysville
46	Penn Coal & Lumber Co	Spring City	89	Penn	Spring City
	Roane County			*Roane County*	
47	Roane Iron Co	Rockwood	90	McLean	Arbutus
	Roane Iron Co	Rockwood	91	Old	Rockwood
48	B. A. Treat	Harriman	92	Treat	Emory Gap

Name and postoffice address of coal mine operators in Tennessee. January 1, 1911—continued.

No.	OPERATOR		No.	MINE	
	County and Name	Postoffice		County and Name	Postoffice
	Scott County			*Scott County*	
49	Baker Coal & Coke Co	Newland	93	Baker	Newland
50	George Coffee	Laxton	94	Coffee	Laxton
51	Glen Mary Coal & Coke Co	Glen Mary	95	Glen Mary 2-4	Glen Mary
	Glen Mary Coal & Coke Co	Glen Mary	96	Glen Mary 5	Glen Mary
52	J. V. LeMoyne	Baltimore, Md	97	LeMoyne	Isham
53	Oneida Coal Co	Oneida	98	Oneida	Oneida
54	W. Phillips	Laxton	99	Paint Rock 3	Laxton
55	Pine Knot Coal Co	Harriman	100	PineKnot	Laxton
56	Scott Co Coal Co	Helenwood	101	Lehigh 5	Helenwood
	Scott Co Coal Co	Helenwood	102	Lehigh 6	Helenwood
57	Southern Clay Mfg. Co	Chattanooga	103	Southern Clay	Robbins
58	Stanley Coal Co	Harriman	104	Stanley	Oneida r f d
59	Virginia Mining Co	Roberta	105	Phillips	Roberta
	Virginia Mining Co	Roberta	106	West Hollow	Roberta
60	R. A. Woods & Co	Oneida	107	Paint Rock 1	Oneida r f d
	R. A. Woods & Co	Oneida	108	Paint Rock 2	Oneida r f d
61	W. H. Workman	Meeks	109	Workman	Laxton
	Anderson County			*Anderson County*	
62	Black Diamond Coal Co	Knoxville	110	Black Diamond 1	Coal Creek
	Black Diamond Coal Co	Knoxville	111	Black Diamond 5	Coal Creek
	Black Diamond Coal Co	Knoxville	112	Black Diamond 6	Briceville
63	Briceville Coal Co	Briceville	113	Andys Ridge	Briceville
64	Coal Creek Coal Co	Knoxville	114	Fraterville	Coal Creek
	Coal Creek Coal Co	Knoxville	115	Taft	Coal Creek
	Coal Creek Coal Co	Knoxville	116	Thistle	Coal Creek
65	Coal Creek Min. & Mfg. Co	Knoxville	117	Piedmont 2	Oliver Springs
	Coal Creek Min. & Mfg. Co	Knoxville	118	Piedmont 4	Oliver Springs
66	Knoxville Iron Co	Knoxville	119	Cross Mt. 1	Briceville
	Knoxville Iron Co	Knoxville	120	Cross Mt. 3	Briceville
67	Minersville Coal Co	Piess	121	Brookside	Piess
	Minersville Coal Co	Piess	122	Buck Mt.	Piess
	Minersville Coal Co	Piess	123	Eureka 2	Piess
68	Tennessee Coal Co	Knoxville	124	Middle Ridge	Briceville
	Tennessee Coal Co	Knoxville	125	Tennessee	Briceville
69	Windrock Coal & Coke Co	Windrock	126	Windrock	Windrock
	Campbell County			*Campbell County*	
70	Anchor Coal Co	Knoxville	127	Anchor	Morley
71	Lewis Baird	Elk Valley	128	Baird, B. G	Elk Valley
72	Bear Wallow Coal Co	Caryville	129	Bear Wallow	Caryville
73	Big Block Coal Co	Cupp	130	Big Block	Cupp
74	Block Coal & Coke Co	Block	131	Block 2	Block
	Block Coal & Coke Co	Block	132	Block 3	Block
75	Blue Gem Coal Co	Jellico	133	Blue Gem (Speed)	Jellico
76	Campbell Coal Mining Co	Westbourne	134	Jackson	Westbourne
77	Caryville Coal Co	Caryville	135	Caryville	Caryville
78	Chaska Coal Co	Knoxville	136	Chaska 1	Chaska
	Chaska Coal Co	Knoxville	137	Chaska 3	Chaska
79	Davis Creek Coal Co	Cupp	138	Davis Creek 1	Cupp
	Davis Creek Coal Co	Cupp	139	Davis Creek 2	Cupp
80	Elk Hart B. G. Coal Co	Briceville	140	Elk Hart B. G	Elk Valley
81	Elk Valley Jellico Coal Co	Elk Valley	141	Elk Valley	Elk Valley
82	Evans Coal Co	Jellico	142	Evans	Jellico
83	Falls Branch Coal Co	Wooldridge	143	Falls Branch	Wooldridge
	Falls Branch Coal Co	Wooldridge	144	Powhattan	Wooldridge

Name and postoffice address of coal mine operators in Tennessee. January 1, 1911—continued.

No.	OPERATOR		No.	MINE	
	County and Name	Postoffice		County and Name	Postoffice
	Campbell Co.—Con.			*Campbell Co.—Con.*	
84	Italian B. G. Coal Co	Newcomb	145	Italian B. G	Newcomb
85	Italy Coal Co	Jellico	146	Italy	Cupp
86	Jellico B. G. Coal Co	Jellico	147	Jellico B. G	Jellico
87	Jellico Cannel Coal Co	Newcomb	148	Jellico-Cannel	Newcomb
88	Kimberly Mining Co	Knoxville	149	Kimberly	Cupp
89	LaFollette C. I. & Ry. Co	LaFollette	150	Gem	Peabody
	LaFollette C. I. & Ry. Co	LaFollette	151	Rex 1	LaFollette
	LaFollette C. I. & Ry. Co	LaFollette	152	Rex 2	LaFollette
90	Morley Coal Co	Morley	153	Morley	Morley
91	A. T. Newman	Jellico	154	Newman	Jellico
92	Procter Coal Co	Red Ash, Ky	155	Indian Mt. 1	Jellico
	Procter Coal Co	Red Ash, Ky	156	Indian Mt. 2	Jellico
93	Red Ash Coal Co	Caryville	157	Red Ash	Caryville
94	Remy Coal Co	Gatliff	158	Remy	Gatliff
95	Rich Mt. Coal & C. Co	Bennett	159	Rich Mt. 1	Bennett
96	Rock Spring Coal Co	Turley	160	Rock Spring	Turley
97	Royal Coal & Coke Co	Knoxville	161	Cambria	Coal Creek
98	Southern Coal & Coke Co	Gatliff	162	Southern 1	Gatliff
	Southern Coal & Coke Co	Gatliff	163	Southern 2	Gatliff
99	Sun Coal Co	Caryville	164	Sun	Caryville
100	Tenn.-Jellico Coal Co	Anthras	165	Tenn.-Jellico	Anthras
101	Westbourne Coal Co	Westbourne	166	Westbourne 1-2	Westbourne
	Westbourne Coal Co	Westbourne	167	Westbourne 3	Westbourne
102	Whistle Creek-Jellico Coal Co	Newcomb	168	Whistle Creek	Newcomb
103	C. M. Woodward	Jellico	169	Woodward 2	Jellico
104	Wooldridge-Jellico Coal Co	Wooldridge	170	Marion-Anna	Wooldridge
	Wooldridge-Jellico Coal Co	Wooldridge	171	Wooldridge	Wooldridge
105	Wynn Coal Co	Gatliff	172	Wynn	Gatliff
106	Zechini Coal Co	Newcomb	173	Zechini	Newcomb
	Claiborne County			*Claiborne County*	
107	Bryson Mt. Coal & C. Co	Middlesboro, K	174	Bryson Mt 1	Hartranft
	Bryson Mt. Coal & C. Co	Middlesboro, K	175	Bryson Mt. 2	Hartranft
108	Campbell Coal & Coke Co	Eagan	176	Buffalo	Eagan
109	Fork Ridge Coal & C. Co	Fork Ridge	177	Fork Ridge 1 (F)	Fork Ridge
	Fork Ridge Coal & C. Co	Fork Ridge	178	Fork Ridge 2 (S)	Fork Ridge
	Fork Ridge Coal & C. Co	Fork Ridge	179	Fork Ridge 3	Fork Ridge
110	King Mt. Coal Co	Clairfield	180	King Mt	Clairfield
111	Mingo Coal & Coke Co	Hartranft	181	Mingo 1	Hartranft
	Mingo Coal & Coke Co	Hartranft	182	Mingo 2	Hartranft
	Mingo Coal & Coke Co	Hartranft	183	Mingo 3	Hartranft
	Mingo Coal & Coke Co	Hartranft	184	Mingo 5	Hartranft
112	New Jellico Coal Co	Clairfield	185	New Jellico	Clairfield
113	Nicholson Coal Co	Nicholson	186	Nicholson 2	Nicholson
	Nicholson Coal Co	Nicholson	187	Nicholson 3	Nicholson
114	Pruden Coal & Coke Co	Knoxville	188	Pruden	Pruden
115	Reliance Coal & Coke Co	Hartranft	189	Reliance 1-2	Hartranft
	Reliance Coal & Coke Co	Hartranft	190	Reliance 3	Hartranft
116	Standard Coal & Coke Co	Clairfield	191	Standard	Clairfield
117	Sterling Coal & Coke Co	Manring	192	Sterling 1-2	Manring
118	Yellow Creek Coal Co	Middlesboro, K	193	Yellow Creek 2	Bosworth, Ky.
	Yellow Creek Coal Co	Middlesboro, K	194	Yellow Creek 3	Bosworth, Ky.

EMPLOYES, WAGES PAID, AND DAYS ACTIVE

The following table shows the average number of employes in and around the coal mines of Tennessee, and in what capacity employed, by counties and districts, in 1910; also total amount paid for labor and total average number of days active.

Employes in and around Tennessee coal mines in 1910; *also total amount paid for labor and total number of days active.*

Counties and Districts	Underground Workers							Outside Workers				Grand Total Workers Inside and Outside	Total Amount Paid for Labor	Average Number of Days Active
	Pick Miners	Haulage Men	Foremen	Machine Miners	Machine Runners & Helpers	Others Inside	Total Inside	Blacksmiths	Timber Men	Others Outside	Total Outside			
	1	2	3	4	5	6	7	8	9	10	11	12	25-36	44
First District														
Bledsoe	40	5	1	----	----	1	47	1	1	5	7	54	----------	215
Cumberland	40	6	1	----	----	3	50	1	1	14	16	66	----------	258
Fentress	88	8	1	----	----	12	109	1	2	20	23	132	----------	295
Grundy	465	48	12	----	----	11	536	5	3	31	39	575	----------	238
Marion	676	82	12	11	9	87	877	10	16	112	138	1,015	----------	254
Overton	89	18	3	----	----	11	121	3	2	16	21	142	----------	228
Sequatchie	123	20	2	----	----	9	154	1	----	48	49	203	----------	202
White	254	62	6	101	34	94	551	12	11	104	127	678	----------	239
Total	1,775	249	38	112	43	228	2,445	34	36	350	420	2,865	$1,338,870	243
Second District														
Hamilton	250	62	6	----	----	106	424	5	8	63	76	500	----------	229
Morgan	489	79	20	90	22	74	774	10	21	58	89	a863	----------	181
Rhea	152	50	5	----	----	15	222	3	----	37	40	262	----------	286
Roane	142	61	5	----	----	69	277	2	5	36	43	320	----------	254
Scott	201	31	10	60	8	22	332	5	7	30	42	374	----------	191
Total	1,234	283	46	150	30	286	2,029	25	41	224	290	2,319	$ 906,587	225
Third District														
Anderson	641	153	16	162	32	80	1,084	16	39	154	209	1,293	----------	216
Campbell	1,620	359	43	404	110	176	2,712	45	65	289	399	3,111	----------	229
Claiborne	852	212	19	137	49	130	1,399	17	36	134	187	1,586	----------	263
Total	3,113	724	78	703	191	386	5,195	78	140	577	795	5,990	$2,946,961	236
Grand total	6,122	1,256	162	965	264	900	9,669	137	217	1,151	1,505	11,174	$5,192,418	236

a —Of this number 427 were at the State Mines at Petros.

WAGES PAID EMPLOYES PER DAY

The following table shows average wages paid per day to employes in and around the coal mines of Tennessee in 1910, by districts.

Average wages paid to employes of Tennessee coal mines per day in 1910.

Counties and Districts	Underground Workers							Outside Workers				Grand Total Workers Inside and Outside
	Pick Miners	Haulage Men	Foremen	Machine Miners	Machine Runners and Helpers	Others Inside	Total Inside	Blacksmiths	Timber Men	Others Outside	Total Outside	
	13	14	15	16	17	18	19	20	21	22	23	24
First District												
Bledsoe	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Cumberland	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Fentress	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Grundy	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Marion	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Overton	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Sequatchie	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
White	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Total	$2.06	$1.48	$3.33	$1.91	$2.33	$1.52	$1.97	$1.93	$1.75	$1.60	$1.63	$1.92
Second District												
Hamilton	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Morgan	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rhea	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Roane	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Scott	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Total	$2.51	$1.64	$2.69	$1.43	$1.96	$1.85	$2.21	$2.32	$1.65	$1.54	$1.62	$2.13
Third District												
Anderson	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Campbell	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Claiborne	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Total	$2.18	$1.94	$3.87	$1.85	$2.12	$1.92	$2.12	$2.24	$2.13	$1.83	$1.92	$2.08
Grand Total	$2.20	$1.80	$3.43	$1.80	$2.15	$1.77	$2.09	$2.17	$1.97	$1.71	$1.79	$2.05

PRODUCTION AND VALUE OF COAL

The following table shows coal product and value of Tennessee coal mines in 1910, by counties, also disposition of product and average value per ton obtained.

Coal product and values, disposition of product, and average value per ton obtained in 1910.

COUNTY	Coal Product (Short Tons)					Coal Values	
	Loaded for Shipment	Used for Fuel and Steam	Sold Local Trade and Employes	Coked	Total Product	Total Value	Average Value Per Ton
	37	38	39	40	41	42	43
Anderson	783,630	13,889	4,555	----	802,074	$834,149	$1.04
Bledsoe	27,500	200	300	----	28,000	30,800	1.10
Campbell	1,655,257	33,015	19,397	8,896	1,716,565	2,016,181	1.17
Claiborne	1,502,499	18,585	2,532	----	1,523,416	1,527,729	1.00
Cumberland	48,643	1,135	202	----	49,980	56,375	1.13
Fentress	96,114	2,734	189	----	99,037	106,857	1.09
Grundy	320,868	1,571	1,776	32,995	357,210	393,212	1.10
Hamilton	193,853	7,707	7,706	68,853	278,119	320,975	1.15
Marion	492,156	9,663	4,797	41,300	547,916	692,421	1.26
Morgan	385,216	11,218	2,627	105,985	a505,046	a482,180	0.96
Overton	77,156	914	265	----	78,335	77,791	1.00
Rhea	----	3,811	9,120	135,965	148,896	208,976	1.40
Roane	5,481	10,654	3,000	175,264	194,399	234,035	1.20
Scott	128,020	2,200	2,457	----	132,677	158,986	1.20
Sequatchie	35,134	2,133	852	46,067	84,186	93,445	1.11
White	344,965	15,428	2,439	----	362,832	392,728	1.08
Total	6,096,492	134,657	62,214	615,325	6,908,688	$7,626,840	$1.10

a The product of the state operations at Brushy Mountain Mines at Petros amounted to 333,639 short tons valued at $307,564, or 92 cents per ton. The product of Morgan County excluding the operations of the State mines, amounted to 171,407 short tons, valued at $174,616, or 1.02 cents per ton.

PRODUCTION OF COAL IN TENNESSEE 1840-1910

The following statement shows coal production of Tennessee from earliest times, 1840, to close of 1910, and coal values of Tennessee from 1873 to 1910, inclusive.

Coal product and values of Tennessee 1840 *to* 1910, *inclusive.*

YEAR	Product (short tons)	Value (dollars)	Value per ton	YEAR	Product (short tons)	Value (dollars)	Value per ton
1840[a]	558			1875	360,000	396,000	$1.10
1841	600			1876	550,000	605,000	1.10
1842	1,000			1877	450,000	495,000	1.10
1843	4,500			1878	375,000	412,000	1.10
1844	10,000			1879	496,131	545,744	1.10
1845	18,000			1880	641,042	769,250	1.20
1846	25,000			1881	750,000	900,000	1.20
1847	30,000			1882	850,000	1,020,000	1.20
1848	40,000			1883	1,000,000	1,150,000	1.15
1849	52,000			1884	1,200,000	1,380,000	1.15
1850	60,000			1885	1,440,957	1,585,052	1.10
1851	70,000			1886	1,714,290	1,885,719	1.10
1852	75,000			1887	1,900,000	2,090,000	1.10
1853	85,000			1888	1,967,297	2,164,026	1.10
1854	90,000			1889	1,925,689	2,338,309	1.21
1855	100,000			1890	2,169,585	2,386,543	1.10
1856	115,000			1891	2,404,484	2,655,045	1.10
1857	125,000			1892	2,332,677	2,635,924	1.13
1858	135,000			1893	1,902,258	2,048,449	1.08
1859	150,000			1894	2,180,879	2,119,481	0.97
1860[a]	165,300			1895	2,319,720	2,157,340	0.93
1861	150,000			1896	2,663,714	2,251,064	0.86
1862	140,000			1897	2,880,994	2,316,239	0.81
1863	100,000			1898	3,084,748	2,340,346	0.77
1864	100,000			1899	3,736,134	3,287,797	0.88
1865	100,000			1900	3,904,048	4,294,928	1.10
1866	100,000			1901	3,785,672	4,115,974	1.09
1867	110,000			1902	4,232,332	5,278,921	1.25
1868	125,000			1903	4,810,758	6,173,724	1.28
1869	130,000			1904	4,847,242	5,617,095	1.16
1870[a]	133,418			1905	5,552,576	6,496,865	1.17
1871	180,000			1906	6,272,457	7,565,286	1.20
1872	224,000			1907	6,940,911	8,482,899	1.22
1873	350,000	385,000	$1.10	1908	6,082,851	6,961,393	1.14
1874	350,000	385,000	$1.10	1909	6,207,483	6,757,824	1.09
				1910	6,908,688	7,626,840	1.10

[a] U. S. census (fiscal report). All other data from 1841 to 1872, inclusive, obtained from U. S. Geological Survey (fiscal report).

COAL PRODUCT AND VALUES IN 1910 COMPARED WITH 1909

The following table shows coal product and values and value per ton in Tennessee, by counties and districts, in 1910, compared with 1909, and increases and decreases.

Coal product and values in Tennessee in 1910, *compared with* 1909.

COUNTIES AND DISTRICTS	1910			1909			Increase (+), or Decrease (—), 1910	
	Product (Short Tons)	Value (Dollars)	Value Per Ton	Product (Short Tons)	Value (Dollars)	Value Per Ton	Product (Short Tons)	Value (Dollars)
First District.								
Bledsoe	28,000	30,800	$1.10	19,300	21,230	$1.10	+ 8,700	+ 9,570
Cumberland	49,980	56,375	1.13	64,839	62,141	0.96	— 14,859	— 5,766
Fentress	99,037	106,857	1.09	76,430	79,819	1.04	+ 22,607	+ 27,038
Grundy	357,210	393,212	1.10	335,448	368,667	1.10	+ 21,762	+ 24,545
Marion	547,916	692,421	1.26	469,154	594,729	1.27	+ 78,762	+ 97,692
Overton	78,335	77,791	1.00	50,990	50,993	1.00	+ 27,345	+ 26,798
Sequatchie	84,186	93,445	1.11	21,510	26,887	1.25	+ 62,676	+ 66,558
White	362,832	392,728	1.08	310,874	336,719	1.08	+ 51,958	+ 56,009
Total	1,607,496	1,843,629	$1.14	1,348,545	1,541,185	$1.14	+ 258,951	+ 302,444
Second District								
Hamilton	278,119	320,975	$1.15	224,203	256,750	$1.15	+ 53,916	+ 64,225
Morgan	505,046	482,180	0.96	455,202	431,589	0.95	+ 49,844	+ 50,591
Rhea	148,896	208,976	1.40	117,926	156,524	1.33	+ 30,970	+ 52,452
Roane	194,399	234,035	1.20	183,006	214,915	1.17	+ 11,393	+ 19,120
Scott	132,677	158,986	1.20	124,209	145,981	1.18	+ 8,468	+ 13,005
Total	1,259,137	1,405,152	$1.11	1,104,546	1,205,759	$1.10	+ 154,591	+ 199,393
Third District								
Anderson	802,074	834,149	$1.04	786,867	827,601	$1.05	+ 15,207	+ 6,548
Campbell	1,716,565	2,016,181	1.17	1,590,189	1,815,487	1.14	+ 126,376	+ 200,694
Claiborne	1,523,416	1,527,729	1.00	1,377,336	1,367,792	1.00	+ 146,080	+ 159,937
Total	4,042,055	4,378,059	$1.08	3,754,392	4,010,880	$1.07	+ 287,663	+ 367,179
Grand total	6,908,688	7,626,840	$1.10	6,207,483	6,757,824	$1.09	+ 701,205	+ 869,016

RECAPITULATION.

DISTRICT	INCREASE IN 1910		DECREASE IN 1910	
	Product (Short Tons)	Value	Product (Short Tons)	Value
First	273,810	$308,210	14,859	$5,766
Second	154,591	199,393	----------	----------
Third	287,663	367,179	----------	----------
Total	716,064	$874,782	14,859	$ 5,766

	Product	Value
Total Increases	716,064	$ 874,782
Total Decreases	14,859	5,766
Net Increase or Decrease	+ 701,205	+ $869,016

RANK OF COAL PRODUCING COUNTIES

The following table shows rank of coal producing counties in Tennessee in 1910, first in quantity of product and then in value of product, with percentage of each contributed by each county.

Relative rank of coal producing counties in Tennessee in 1910, with amount and value of product, and percentage of each.

Rank	COUNTY	Amount of Product (Short Tons)	Per Cent of Total Product	Rank	COUNTY	Value of Product	Per Cent of Total Product
1	Campbell	1,716,565	24.85	1	Campbell	$2,016,181	26.43
2	Claiborne	1,523,416	22.05	2	Claiborne	1,527,729	20.03
3	Anderson	802,074	16.61	3	Anderson	834,149	10.94
4	Marion	547,916	7.93	4	Marion	692,421	9.08
5	Morgan	505,046	7.31	5	Morgan	482,180	6.32
6	White	362,832	5.25	6	Grundy	393,212	5.16
7	Grundy	357,210	5.17	7	White	392,728	5.15
8	Hamilton	278,119	4.03	8	Hamilton	320,975	4.21
9	Roane	194,399	2.82	9	Roane	234,035	3.07
10	Rhea	148,896	2.16	10	Rhea	208,976	2.74
11	Scott	132,677	1.92	11	Scott	158,986	2.09
12	Fentress	99,037	1.43	12	Fentress	106,857	1.40
13	Sequatchie	84,186	1.22	13	Sequatchie	93,445	1.22
14	Overton	78,335	1.13	14	Overton	77,791	1.02
15	Cumberland	49,980	.71	15	Cumberland	56,375	.74
16	Bledsoe	28,000	.41	16	Bledsoe	30,800	.40
	Total	6,908,688	100.00		Total	$7,626,840	100.00

It will be observed from this table that Campbell County is the first in rank of coal producing counties, furnishing 24.85 per cent of the total product, and also first in rank as to coal values, furnishing 26.43 per cent of the total coal values for the state. Claiborne County furnished 22.05 per cent of the total coal product for the state, while it only furnished 20.03 per cent of the total coal values for the state. Grundy County is seventh in rank as to coal product, but sixth in rank as to coal values. White County is sixth in rank as to coal product, while it is seventh in rank as to coal values.

RANK OF COAL PRODUCING COUNTIES 1891-1910

The following table shows relative rank of coal producing counties in Tennessee from 1891 to 1910, inclusive.

Relative rank of coal producing counties from 1891 *to* 1910, *inclusive.*

COUNTY	YEAR																			
	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910
Anderson	1	1	1	1	2	1	1	1	1	1	1	1	3	3	3	3	3	3	3	3
Bledsoe	--	--	--	--	--	--	--	--	--	--	--	14	15	15	15	16	16	14	16	16
Campbell	6	3	3	4	4	2	2	2	3	2	2	3	2	2	1	1	1	1	1	1
Claiborne	11	6	5	5	5	6	6	5	4	4	3	2	1	1	2	2	2	2	2	2
Cumberland	14	14	14	14	14	13	13	13	13	12	12	11	10	10	14	14	14	15	13	15
Fentress	--	--	--	--	--	--	--	--	--	--	--	--	--	14	12	12	13	10	12	12
Franklin	12	12	12	12	13	14	14	14	15	15	--	--	--	--	--	--	--	--	--	--
Grundy	2	2	2	2	1	3	3	6	5	5	6	5	6	6	6	6	5	5	6	7
Hamilton	4	8	7	6	6	9	7	9	7	8	7	6	7	7	8	8	8	12	8	8
Marion	3	4	4	3	3	4	4	4	6	6	5	7	5	5	5	7	7	6	4	4
Morgan	8	11	10	11	11	5	5	3	2	3	4	4	4	4	4	4	4	4	5	5
Overton	--	--	--	--	--	--	--	--	--	--	15	15	13	13	13	13	15	13	14	14
Putnam	13	13	13	13	12	12	12	12	12	13	13	--	--	--	--	--	17	16	--	--
Rhea	5	7	9	8	10	11	10	7	8	7	9	8	8	8	9	9	9	9	11	10
Roane	9	9	11	9	9	8	8	10	9	10	10	10	11	11	10	11	11	8	9	9
Scott	7	5	6	7	7	7	11	11	11	11	11	12	12	12	11	10	10	11	10	11
Sequatchie	--	--	--	--	--	--	--	--	14	14	14	13	14	16	16	15	12	--	15	13
White	10	10	8	10	8	10	9	8	10	9	8	9	9	9	7	5	6		7	6

It will be observed from this table that Anderson County, with the exception of the year 1895, maintained the lead from 1891 to 1902, inclusive, when it was assumed and held by the county of Claiborne for two years. It was then assumed and is now held by the county of Campbell, with Claiborne rankisg second and Anderson third.

As compared with 1909, White County has captured sixth position in rank from Grundy County, Rhea County has captured tenth position in rank from Scott, while Sequatchie has captured thirteenth position in rank from Cumberland.

RANK OF COAL PRODUCING STATES

The following table gives rank of coal producing states in the United States in 1909, first in quantity of product and second in value of product, with percentage of each:

Rank of coal producing States in 1909, with quantity and value of product and percentage of each.

PRODUCTION				VALUE			
Rank	State or Territory	Quantity (short tons)	Percentage of total production	Rank	State or Territory	Value	Percentage of total value
1	Pennsylvania:			1	Pennsylvania:		
	Anthracite	81,059,159	17.6		Anthracite	$149,415,847	29.9
	Bituminous	137,966,791	29.9		Bituminous	130,085,237	23.4
2	West Virginia	51,849,220	11.2	2	Illinois	53,522,014	9.6
3	Illinois	50,904,990	11.0	3	West Virginia	44,661,716	8.1
4	Ohio	27,939,641	6.1	4	Ohio	27,789,010	5.0
5	Indiana	14,834,259	3.2	5	Alabama	16,306,236	2.9
6	Alabama	13,703,450	3.0	6	Indiana	15,151,681	2.7
7	Colorado	10,716,936	2.3	7	Colorado	14,296,012	2.6
8	Kentucky	10,697,384	2.3	8	Iowa	12,793,628	2.3
9	Iowa	7,757,762	1.7	9	Kansas	10,083,384	1.8
10	Kansas	6,986,478	1.5	10	Kentucky	10,079,917	1.8
11	Wyoming	6,393,109	1.4	11	Wyoming	9,896,848	1.8
12	Tennessee	6,358,645	1.4	12	Washington	9,158,999	1.7
13	Virginia	4,752,217	1.0	13	Tennessee	6,920,564	1.2
14	Maryland	4,023,241	.9	14	Oklahoma	6,253,367	1.1
15	Missouri	3,756,530	.8	15	Missouri	6,183,626	1.1
16	Washington	3,602,263	.8	16	Montana	5,036,942	.9
17	Oklahoma	3,119,377	.7	17	Maryland	4,471,731	.8
18	New Mexico	2,801,128	.6	18	Virginia	4,251,056	.8
19	Montana	2,553,940	.6	19	Utah	3,751,810	.7
20	Arkansas	2,377,157	.5	20	New Mexico	3,619,744	.7
21	Utah	2,266,899	.5	21	Arkansas	3,523,139	.6
22	Texas	1,824,440	.4	22	Michigan	3,199,351	.6
23	Michigan	1,784,692	.4	23	Texas	3,141,945	.6
24	North Dakota	422,047	.1	24	North Dakota	645,142	.1
25	Georgia	211,196		25	Georgia	298,792	.1
26	Oregon	87,276		26	Oregon	235,085	
27	California and Alaska	48,636	.1	27	California and Alaska	107,342	.1
28	Idaho	4,553		28	Idaho	19,459	
	Total	460,803,416	100.0		Total	$544,902,624	100.0

Compared with 1908, as to product, West Virginia captured the second position in rank from Illinois, Colorado captured seventh position in rank from Kentucky, while Wyoming captured eleventh position in rank from Tennessee.

Compared with 1908, as to value, Indiana captured sixth position in rank from Colorado, and Washington captured twelfth position in rank from Tennessee, and Montana captured sixteenth position in rank from Maryland.

COAL PRODUCTION IN UNITED STATES IN 1909 COMPARED WITH 1908

The following table shows quantity and value of coal produced in the United States in 1909 compared with 1908, with increases and decreases by states, and percentage of each:

Coal produced in the United States in 1909, *compared with* 1908. (*Short tons*).

STATE OR TERRITORY	1908		1909		Increase (+), or Decrease (−), 1909		Percentage of Increase or Decrease, 1909	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Alabama	11,604,593	$14,647,891	13,703,450	$16,306,236	+ 2,098,857	+$1,658,345	+ 18.1	+ 11.3
Arkansas	2,078,357	3,499,470	2,377,157	3,523,139	+ 298,800	+ 23,669	+ 13.9	+ 0.7
California and Alaska	21,862	69,650	48,636	107,342	+ 26,774	+ 37,692	+122.5	+ 54.1
Colorado	9,634,973	13,586,988	10,716,936	14,296,012	+ 1,081,963	+ 709,024	+ 11.2	+ 5.2
Georgia	264,822	364,279	211,196	298,792	− 53,626	− 65,487	− 20.	− 18.
Idaho	5,429	21,832	4,553	19,459	− 876	− 2,373	− 16.14	− 10.9
Illinois	47,659,690	49,978,247	50,904,990	53,522,014	+ 3,245,300	+ 3,543,767	+ 6.8	+ 7.1
Indiana	12,314,890	13,084,297	14,834,259	15,154,681	+ 2,519,369	+ 2,070,384	+ 20.4	+ 15.8
Iowa	7,161,310	11,706,402	7,757,762	12,793,628	+ 596,452	+ 1,087,226	+ 8.3	+ 9.2
Kansas	6,245,508	9,292,222	6,986,478	10,083,384	+ 740,970	+ 791,162	+ 11.9	+ 8.5
Kentucky	10,246,553	10,317,162	10,697,384	10,079,917	+ 450,831	− 237,245	+ 4.5	− 2.3
Maryland	4,377,093	5,116,753	4,023,241	4,471,731	− 353,852	− 645,022	− 8.	− 12.6
Massachusetts	50	150			− 50	− 150	−100.	−100.
Michigan	1,835,019	3,322,904	1,784,692	3,199,351	− 50,327	− 123,553	− 2.7	− 3.7
Missouri	3,317,315	5,444,907	3,756,530	6,183,626	+ 439,215	+ 738,719	+ 12.9	+ 13.5
Montana	1,920,190	3,771,248	2,553,940	5,036,942	+ 633,750	+ 1,265,694	+ 33.	+ 33.6
New Mexico	2,467,937	3,368,753	2,801,128	3,619,744	+ 333,191	+ 250,991	+ 13.5	+ 7.5
North Dakota	320,742	522,116	422,047	645,142	+ 101,305	+ 123,026	+ 31.6	+ 23.9
Ohio	26,270,639	27,897,704	27,939,641	27,789,010	+ 1,669,062	− 108,694	+ 4.4	− .4
Oklahoma	2,948,116	5,976,504	3,119,377	6,253,367	+ 171,261	+ 276,863	+ 5.8	+ .94
Oregon	86,259	236,021	87,276	235,085	+ 1,017	− 936	+ .12	− .04
Pennsylvania (bituminous)	117,179,527	118,816,303	137,966,791	130,085,237	+20,787,264	+11,268,934	+ 17.7	+ 9.5
Tennessee	6,199,171	7,118,499	6,358,645	6,920,564	+ 159,474	− 197,935	+ 2.57	− 2.78
Texas	1,895,377	3,419,481	1,824,440	3,141,945	− 70,937	− 277,536	− 3.2	− 8.1
Utah	1,846,792	3,119,338	2,266,899	3,751,810	+ 420,107	+ 632,472	+ 22.4	+ 20.3
Virginia	4,259,042	3,868,524	4,752,217	4,251,056	+ 493,175	+ 382,532	+ 11.5	+ 9.9
Washington	3,024,943	6,690,412	3,602,263	9,158,999	+ 577,320	+ 2,468,587	+ 19.	+ 37.
West Virginia	41,897,843	40,009,054	51,849,220	44,661,716	+ 9,951,377	+ 4,652,662	+ 23.7	+ 11.6
Wyoming	5,489,902	8,868,157	6,393,109	9,896,848	+ 903,207	+ 1,028,691	+ 16.	+ 11.6
Total (bituminous)	332,573,944	374,135,268	379,744,257	405,486,777	+47,170,313	+31,351,509	+ 14.2	+ 8.4
Pennsylvania (anthracite)	83,268,754	158,178,849	81,059,159	149,415,847	− 2,209,595	− 8,763,002	− 2.7	− 5.5
Grand total	415,842,698	532,314,117	460,803,416	554,902,624	+44,960,718	+22,588,507	+ 10.8	+ 4.2

It will be observed from this table that there was a net increase in coal product in 1909, as compared with 1908, of 44,960,718 short tons, or 10.84 per cent, and an increase in coal values of $22,588,507, or 4.2 per cent. The decrease in 1908, compared with 1907, amounted to 64,520,726 short tons, and $82,484,781.

WORLD'S PRODUCTION OF COAL

In the following table a statement is presented showing the coal production of the principal countries of the world in the years nearest to that under review for which the figures are obtainable. For the sake of convenience the quantities are expressed in the measurement customary in each country and are reduced for comparison to short tons of 2,000 pounds.

The world's production of coal.

COUNTRY	Usual Unit in Producing Country	Equivalent in Short Tons
United States (1909)	long tons	411,431,621	460,803,416
Great Britain (1909)	do	263,774,312	295,427,229
Germany (1909)	metric tons	217,433,488	239,676,934
Austria-Hungary *a*	do	48,204,663	53,136,000
France (1909)	do	37,971,758	41,856,269
Russia and Finland (1908)	do	25,059,100	27,622,646
Belgium (1909)	do	23,517,550	25,923,395
Japan (1909)	do	14,973,617	16,505,418
China (1908)	do	12,000,000	13,476,000
India (1909)	long tons	11,870,114	13,294,528
Canada (1909)	short tons	10,411,955	10,411,955
New South Wales (1909)	long tons	7,019,879	7,862,264
Spain (1908)	metric tons	4,118,276	4,539,576
Transvaal (1909)	long tons	2,957,512	3,312,413
New Zealand (1908)	do	1,860,975	2,084,292
Natal (1909)	do	1,786,583	2,000,973
Mexico (1908)	metric tons	1,024,579	1,129,393
Holland (1908)	do	908,201	999,230
Queensland and Victoria (1908)	long tons	810,294	907,529
Italy (1909)	metric tons	555,073	611,857
Sweden (1909)	do	246,808	272,056
Cape Colony (1908)	long tons	109,701	122,865
Tasmania (1909)	do	66,161	74,100
Other countries *b*	do	5,069,292	5,677,342
Total			1,227,727,680
Percentage of the United States			37.5

a Austria figures are for 1909; Hungary, 1908.

b Includes Turkey, Servia, Portugal, United States of Colombia, Chile, Borneo and Labuan, Peru, Greece, etc.

It will be observed from this table that the United States now furnishes 37.5 per cent of the total coal supply of the world. In 1868 the United States only furnished 15 per cent of the world's total coal supply. Great Britian was first in rank of coal producing countries up to 1899. The United States assumed the lead in 1899 and has since maintained it.

Of the total world's production of coal, 98 per cent comes from countries lying north of the equator, the countries south of the equator producing less than twenty million tons annually.

DRAFT ANIMALS, EXPLOSIVES AND MINE CARS

The following table shows draft animals, explosives used and number of mine cars employed in the mines of Tennessee in 1910, by counties and districts.

Draft animals, explosives and mine cars used in Tennessee coal mines in 1910.

COUNTY AND DISTRICT	Draft Animals			Explosives Used		Mine Cars in Use
	Inside	Outside	Total	Powder (kegs)	Dynamite (Pounds)	
	45	46	47	48	49	50
First District						
Bledsoe	5	3	8	600		80
Cumberland	5	2	7	2,506	395	70
Fentress		2	2			212
Grundy	72	13	85	7,827		643
Marion	345	97	442	10,409	6,080	1,195
Overton	11	1	12	5,190	982	208
Sequatchie	11	8	19	2,563		180
White	154	40	194	11,074	5,650	601
Total	603	166	769	40,169	13,107	3,189
Second District						
Hamilton	51	16	67	12,416	16,245	874
Morgan	56	30	86	4,219	35,554	1,232
Rhea	27	2	29	4,102	37,144	401
Roane	48	5	53	3,128	7,740	345
Scott	31	5	36	7,245	6,675	546
Total	213	58	271	31,110	103,358	3,398
Third District						
Anderson	144	39	183	7,705	14,895	2,133
Campbell	238	49	287	31,370	28,143	4,450
Claiborne	130	25	155	9,331	20,666	2,234
Total	512	113	625	48,406	63,704	8,817
Grand Total	1,328	337	1,665	119,685	180,169	15,404

Note.—In addition to the explosives given above, there were 26,205 pounds of carbonite and 79,272 pounds of monobel, which are both permissible explosives, reported to have been used in Marion and Rhea counties.

MINING MACHINES AND IMPROVEMENTS

The following table shows the number and make of mining machines in use, quantity of coal mined with machines, and improvements made in the coal mines of Tennessee in 1910.

Mining machines, coal mined with machines and improvements made in Tennessee coal mines in 1910.

COUNTY AND DISTRICT	Mining Machines in Use, Make and Number											Coal Mined with Machines (Short Tons)	Improvements Made		
	Pick					Chain Breast							Inside	Outside	Total
	Harrison	Ing.-Sargent	Sullivan	Other Kinds	Total Pick	Jeffrey-Elec.	Sullivan	Goodman	Morgan-Gardner	Total Chain Breast	Other Kinds	Grand Total Machines			
	51	52	53	54	55	56	57	58	59	60	60 a	61	62	63	64	65
First District																
Bledsoe	--	--	--	--	--	--	--	--	--	--	--	--	--------	$ -------	$ -------	$ -------
Cumberland	--	--	--	--	--	--	--	--	--	--	--	--	--------	--------	--------	--------
Fentress	--	--	--	--	--	--	--	--	--	--	--	--	--------	--------	--------	--------
Grundy	--	--	--	--	--	--	--	--	--	--	--	--	--------	--------	--------	--------
Marion	--	7	--	--	7	--	--	--	--	--	--	7	42,000	25,550	25,519	51,069
Overton	--	--	--	--	--	--	--	--	--	--	--	--	--------	900	2,337	3,237
Sequatchie	--	--	--	--	--	--	--	--	--	--	--	--	--------	--------	6,000	6,000
White	--	22	4	--	26	--	--	6	--	6	--	32	134,731	900	--------	900
Total	--	29	4	--	33	--	--	6	--	6	--	39	176,731	$ 27,350	$ 33,856	$ 61,206
Second District																
Hamilton	--	--	--	--	--	--	--	--	--	--	--	--	--------	$ 2,000	$ 11,750	$ 13,750
Morgan	3	9	1	--	13	1	3	--	--	4	3	20	59,642	14,110	61,307	75,417
Rhea	--	--	--	--	--	--	--	--	--	--	--	--	--------	1,500	--------	1,500
Roane	--	--	--	--	--	--	--	--	--	--	--	--	--------	12,000	--------	12,000
Scott	--	--	--	1	1	1	2	--	--	3	--	4	29,500	6,650	6,650	13,300
Total	3	9	1	1	14	2	5	--	--	7	3	24	89,142	$ 36,260	$79,707	$115,967
Third District														3		
Anderson	2	13	5	1	21	6	2	2	--	10	--	31	226,542	$ 2,585	$7,305	$ 9,888
Campbell	39	28	19	--	86	3	9	1	3	16	--	102	404,234	41,655	90,025	131,680
Claiborne	8	13	1	--	22	1	6	2	--	9	--	31	254,881	16,59	16,292	32,887
Total	49	54	25	1	129	10	17	5	3	35	--	164	885,657	$ 60,833	$113,622	$174,455
Grand total	52	92	30	2	176	12	22	11	3	48	3	227	1,151,530	$124,443	$227,185	$351,628

COAL SEAMS

The following table shows name, thickness, elevation and analyses of such coal seams worked in Tennessee as were embodied in the annual reports of the operating companies, by counties, giving name of company and average daily capacity.

Name, thickness, elevation and analysis of coal seams worked in Tennessee in 1910.

OPERATOR	Average Daily Capacity Short Tons	SEAM WORKED			ANALYSIS				
County and Name		Name	Elevation Above Sea Level (feet)	Thickness Inches	Fixed Carbon (Per cent)	Volatile Matter (Per cent)	Ash (Per cent)	Moisture (Per cent)	Sulphur (Per cent)
	85	80	81	82	68	69	70	71	72
Anderson County									
Black Diamond Coal Co	1,600	Coal Creek	900	44	63.15	29.78	2.65	2.35	0.19
Coal Creek Coal Co	100	Coal Creek	1,100	42	55.00	40.05	2.50	1.00	1.00
Coal Creek Mining & Mfg. Co	600	Coal Creek	1,000	48	57.52	38.82	2.67	0.99	0.89
Knoxville Iron Co	1,000	Coal Creek	1,006	48	55.10	40.75	3.40	0.75	0.78
Minersville Coal Co	460	Coal Creek	1,000	42	60.17	35.54	2.40	1.29	0.60
Tennessee Coal Co	600	Coal Creek	975	48	63.42	31.47	3.34	1.34	0.43
Windrock Coal & Coke Co	800	Dean	2,400	60	57.30	37.01	3.15	1.02	0.68
Bledsoe County									
Atpontley Coal Co	200	Sewanee	1,500	34	63.57	28.17	7.10	1.16	1.15
Campbell County									
Big Block Coal Co	75	Jellico		30	57.45	31.61	2.04	1.85	1.05
Block Coal & Coke Co	300	Block	2,360	38	50.77	46.53	1.43	1.27	----
Blue Gem Coal Co	200	Blue Gem	1,400	26	51.27	44.79	1.24	2.70	0.90
Caryville Coal Co	300	Block	2,445	45	60.87	35.29	1.68	1.55	0.61
Chaska Coal Co	125	Big Jellico	1,600	27–48	54.40	37.14	6.45	2.07	2.67
Davis Creek Coal Co	177	Jellico		40	53.43	40.46	0.54	0.57	2.23
Falls Branch Coal Co	312	Jellico	1,250	36	60.60	35.44	1.60	2.36	----
Italian B. G. Coal Co	10	Blue Gem	1,200	22	56.40	39.00	1.25	2.44	0.70
Italy Coal Co	80	Jellico	1,275	30	57.45	37.61	2.04	1.85	1.05
Jellico B. G. Coal Co	250	Blue Gem	1,200	24	55.71	40.54	1.09	2.65	----
LaFollette Coal, Iron & Ry. Co.:									
Gem Mine	2,000	Jordan	1,998	50	56.25	41.36	1.72	0.67	0.65
Kent Mine		Kent	1,500	42	51.95	40.60	6.55	0.90	----
Rex, No. 1 Mine		Rex	1,000	44	56.28	40.26	3.46	2.50	1.21
Morley Coal Co	100	Kramor	1,370	33	58.18	38.56	2.25	2.01	0.70
Procter Coal Co	300	Jellico	1,300	42	61.02	36.50	2.00	0.48	----
Red Ash Coal Co	350	Red Ash	2,250	42	58.52	37.72	1.74	2.02	----
Remy Coal Co	350	Rich Mt		36	54.24	42.64	1.42	1.70	0.65
Royal Coal & Coke Co	250	Coal Creek	1,008	40	60.17	35.54	2.40	1.29	0.60
Southern Coal & Coke Co	400	Jordan	1,800	55	59.25	36.32	2.13	2.30	1.07
Westbourne Coal Co	300	Log Mt		42	56.25	41.36	1.72	0.67	0.78
Wooldridge-Jellico Coal Co	500	Jellico	1,200	38	60.60	35.44	1.60	2.36	----
Claiborne County									
Bryson Mt. Coal & Coke Co	1,000	Mingo	1,755	60	60.87	34.63	2.43	1.63	0.44
Campbell Coal & Coke Co	250	Remy	1,425	36	55.66	40.82	1.72	1.80	0.56
Fork Ridge Coal & Coke Co. 1	650	Mingo	1,700	52	59.83	37.19	1.40	0.88	0.70
Fork Ridge Coal & Coke Co. 3	50	Lower Hignite	2,500	48	64.00	30.40	2.60	2.40	0.60
King Mt. Coal Co	200	Jellico	1,100	40	57.04	39.90	1.96	1.10	----
Nicholson Coal Co. No. 2	300	Jack Rock	1,800	66	60.51	34.50	4.99	----	0.75
Nicholson Coal Co. No. 3	250	Klondyke	2,050	66	55.10	36.30	6.30	1.20	1.10
Pruden Coal Co	700	Mingo	1,700	60	57.98	38.82	1.60	1.60	0.72
Reliance Coal & Coke Co	500	Mingo	1,600	60	57.95	40.40	1.35	0.30	----
Standard Coal Co	100	Jellico	1,100	40	63.43	31.80	2.24	1.70	----
Sterling Coal & Coke Co	900	Sterling	2,300	66	61.30	30.70	5.97	2.03	0.86
Yellow Creek Coal Co. No. 2	150	Poplar Lick	2,425	54	60.51	34.50	4.99	1.50	0.72
Yellow Creek Coal Co. No. 3	150	Jack Rock	2,275	54	60.51	34.50	4.99	1.50	0.50

Name, thickness, elevation and analysis of coal seams worked in Tennessee in 1910, *continued.*

OPERATOR		SEAM WORKED			ANALYSIS				
COUNTY AND NAME	Av. Daily Capacity Short Tons	NAME	Elevation Above Sea Level (feet)	Thickness Inches	Fixed Carbon (Per cent)	Volatile Matter (Per cent)	Ash (Per cent)	Moisture (Per cent)	Sulphur (Per cent)
	85	80	81	82	68	69	70	71	72
Cumberland County									
Clear Creek Coal Co	200	Isoline	1,900	44	53.86	42.20	2.21	1.73	1.47
Fall Creek Collieries	300	Up. Sewanee	1,800	50	63.70	30.76	4.82	0.72	0.40
Renfro Coal & Coke Co	50	Sewanee	1,800	42	68.27	28.32	2.32	1.03	0.06
Waldensia Coal & Coke Co	100	Up. Sewanee	1,800	42–60	64.50	29.55	5.50	0.45	0.54
Fentress County									
Fentress Coal & Coke Co	600	Bon Air 2	1,600	48	50.77	35.80	10.06	3.37	2.09
Grundy County									
Flat Branch Coal Co	150	Sewanee	1,916	34	66.80	24.57	7.43	1.20	0.66
Nunely Ridge Coal Co	40	Sewanee	1,900	36	61.68	29.73	7.65	1.04	----
Sewanee Fuel & Iron Co	500	Sewanee	1,920	30	59.88	31.32	7.50	1.30	0.85
Tennessee Consolidated Coal Co	1,500	Sewanee	1,900	42	61.68	29.73	7.65	1.04	----
Hamilton County									
Montlake Coal Co	250	No. 10	1,650	36	61.34	29.17	8.75	0.74	1.67
Durham Coal & Iron Co	200	No. 9	1,250	30	61.22	27.40	10.11	1.27	0.47
Durham Coal & Iron Co	600	No. 7	1,268	27	60.44	29.18	7.16	2.10	1.12
Sale Creek Coal Co	450	No. 2	875	42	60.29	31.27	7.02	1.42	0.60
Marion County									
Battle Creek Coal & Coke Co	460	Battle Creek	1,550	24-312	59.77	34.74	5.12	0.02	0.17
New Etna Coal Co	250	Kelly	2,100	32	73.12	20.26	4.70	1.19	0.73
Nunley Ridge Coal Co	140	Sewanee	1,843	48	61.68	29.73	7.65	1.04	----
Tennessee Coal, Iron & R. R. Co.	1,000	Sewanee	1,764	36	61.57	28.14	8.39	1.90	0.90
Morgan County									
Big Brushy Coal & Coke Co	500	Brushy Mt	1,750	40	62.32	32.32	5.37	----	0.81
Bowling, H. B., Coal Co	500	Coal Creek	1,000	58	55.72	40.89	2.12	0.79	1.10
Oliver Coal Co	75	Coal Creek	800	48	50.71	44.81	2.15	0.25	2.08
Poplar Creek Coal Co	65	Coal Creek	1,150	44	54.08	41.16	2.64	2.12	1.69
State of Tennessee	1,000	Brushy Mt	1,620	33	62.31	32.32	5.37	----	0.81
Overton County									
Brier Hill Collieries	225	Bon Air 2	1,700	40	62.45	30.83	5.54	1.09	1.56
Obey City Coal Co	150	Bon Air 2	1,600	35	53.90	38.98	5.60	1.52	1.83
Rhea Cunty									
Durham Coal & Iron Co, 1	120	No. 2	950	240	60.57	34.23	3.77	1.43	0.51
Durham Coal & Iron Co. 2	400	No. 5	1,250	30	60.24	28.97	9.45	1.34	0.82
Dayton Coal & Iron Co	500	Richland	985	22	59.20	31.00	12.40	----	0.99
Penn Coal & L. Co			1,800	36	55.37	30.33	13.21	1.09	1.37
Roane County									
Roane Iron Co	650	Sewanee	1,082	54	57.69	32.09	9.00	0.60	0.62
Scott County									
Glen Mary Coal & Coke Co	250	No. 4	1,470	30	61.63	36.73	1.64	----	0.29
John V. Lemoyne	100	No. 4	1,200	33	50.20	43.81	4.71	1.28	----
Paint Rock Coal Co	200	No. 5	1,300	27	57.00	37.00	3.25	2.00	0.60
Pine Knot Coal Co	150	No. 5	1,470	30	60.33	35.73	1.64	1.70	0.60
Scott County Coal Co	150	No. 4	1,500	32	53.14	35.76	8.04	1.26	1.80
Stanley Coal Co	275	No. 4	1,400	28	57.00	36.75	3.25	2.00	0.60
Virginia Mining Co	200	No. 4	1,300	33	56.88	36.78	4.32	1.32	1.32
Sequatchie Cunty									
Southern Steel Co	500	Sewanee	1,660	48	60.00	30.00	8.75	1.30	0.72
White County									
Bon Air Coal & Iron Co.:									
Ravenscroft Mine	200	Bon Air	1,800	36	57.00	37.00	4.90	1.10	----
Bon Air Mine	1,000	No. 3	1,800	54	57.50	33.00	7.50	----	2.00
Clifty Creek Coal Co	600	Sewanee	1,600	48	-----	-----	-----	----	----

COAL MINING ACCIDENTS IN TENNESSEE IN 1910

The toll exactions of human life in the coal mining industry of Tennessee in 1910 numbered 38, or 3.40 per cent per 1,000 employed. As compared with 1909, this is an increase of 7 deaths and an increase per 1,000 employed of 0.57 per cent. 43 per cent of this increase occurred at the State mines at Petros. These accidents include all accidents occurring to any employe at work in or around the coal mines, exclusive of those on coke manufacture, terminating fatally at the time the accident occurred, and those of a serious nature terminating fatally after accident occurred.

There were 6,908,688 short tons of coal mined during the year, which required the services of 11,174 employes, exclusive of those engaged in coke manufacture.

There were 181,808 short tons of coal mined for each life lost, while in 1909 there were 200,241 short tons of coal mined for each life lost, and in 1908 there were 178,908 short tons of coal mined for each life lost.

Owing to the appalling loss of life incident to the many recent mine explosions throughout the country, and an enlightened public opinion demanding it, the question of accidents to mining employes in Tennessee is now receiving more serious consideration than ever before. The forms of the Department for accident reports are progressive in their character and call for race, age, conjugal condition, occupation, date of accident, date and hour of death, exact place where the accident occurred, cause of accident, including all surrounding and contributory circumstances and elementary facts in connection therewith.

There were 22 fatal accidents, or 57 per cent, occurring from falling substances, 2, or 5 per cent, occurred from electric wire; 4, or 11 per cent, occurred from dynamite explosion; 4, or 11 per cent, occurred from mine cars and motors; and 6, or 16 per cent, occurred from powder explosion.

The large majority of deaths occurring from falling substances occurred in rooms and were due to inexperience and to negligence on the part of the miner in properly timbering his working place.

There were 6 deaths resulting from powder explosions or windy shots, which embrace premature and delayed blasts, as against only 1 from this cause in 1909. Three of these resulted directly from shooting from the solid, in violation of the Department rules, and special attention is again called to the following chief causes of blown out or windy shots: (1) The overcharge of powder; (2) overburdened shot when the resistance is too great; (3) the hole being deeper than the undercutting; (4) when shots are tamped with coal, coal dust or otherwise improperly tamped; (5) when coal is shot from the solid.

The fatal accident rate in the coal mines of North America in 1909 was 3.39 per cent. In 1908 it was 3.84 per cent, and in 1907 it was 4.15 per cent, while for the ten year period, 1900-1909, it was 3.46 per cent. It will be observed that the death rate for Tennessee, while increased in 1910, is 0.06 per cent lower than the average death rate per 1,000 employed in North America for the ten year period, 1900-1909.

The death rate in the coal mines of foreign countries is only about one-half the rate of North America. The death rate in this country is too large and should be reduced. It has assumed normal proportions in Tennessee since the passage of the present mining laws in 1903 enabling the Department to formulate and enforce mining rules and discipline, but it can be further reduced by intelligent and scientific effort employed in the regulation of the moisture in the air in the mines, as a prevention against gas and dust explosions, and by requiring, when essential for coal to be shot from the solid.

that all firing be done by experienced shot firers, and then only after all miners have been registered on the outside, and by constant and diligent attention to the condition of the roof by mine officials, and by a full appreciation on the part of the miner of the dangers surrounding him when the roof is not properly supported.

The following important tables concerning the mining facilities in Tennessee and in the United States and Canada, and foreign countries, are submitted:

Table No. 1.—Showing fatal accidents in Tennessee coal mines in 1910, with name and occupation of person killed, by mines and counties, alphabetically arranged, experience in mining, station in life, number of children and cause of accident.

Table No. 2.—Showing a general recapitulation of fatal accidents in Tennessee coal mines in 1910, giving number killed, by counties and districts, number by mine, number by occupation, and number by cause of accident.

Table No. 3.—Showing fatal accidents in Tennessee coal mines from 1894 to 1910, inclusive, giving number killed, number of wives made widows, number of children made fatherless, average number of employes, average number of employes to each life lost, total number of tons of coal mined, number of tons of coal mined for each life lost, and total number of tons of coal mined by each employe.

Table No. 4.—Showing non-fatal accidents in Tennessee coal mines in 1910, giving number of persons injured, by counties and mines, alphabetically arranged, date of accident, nomenclature of occupation, and cause and extent of injury.

Table No. 5.—Showing a general recapitulation of non-fatal accidents in Tennessee coal mines in 1910, giving number injured, by county, number by mines, number by occupation, and number by cause of injury.

Table No. 6.—Showing fatal and non-fatal accidents in Tennessee coal mines in 1910, by causes of accidents and by counties. It will be observed from this table that out of 248 accidents, 38, or 15.32 per cent, were fatal, which is practically two for every thirteen accidents occurring. There were 126, or 51 per cent, of all accidents occurring, due to falling roof and other substances; 67, or 27.01 per cent, occurred from mine cars and motors; 14, or 5.65 per cent, occurred from powder explosions and windy shots from premature or delayed blasts; 4, or 1.61 per cent, occurred from gas explosions; and 37, or 14.73 per cent, occurred from other causes. In those reported under other causes, two were killed by electricity.

Table No. 7.—Showing fatal and non-fatal accidents in the United States, by causes of accidents, by states. It will be observed from this table that in 1909 there were 10,391 accidents reported, of which 2,412, or 23.21 per cent, were fatal. In 1908 26.56 per cent of total accident frequency in the United States were fatal. There was one person killed for every 43 accidents occurring. Of the total accidents, 672, or 6.47 per cent, occurred from gas and dust explosions; 325, or 3.13 per cent, occurred from powder explosions and windy shots; 4371, or 42.06 per cent, occurred from falling substances; and 5,023, or 48.34 per cent, occurred from other causes.

Table No. 8.—Showing total number of fatal accidents in the coal mines of North America, from 1900 to 1909, inclusive, and also for the ten year period, 1900-1909, by states and provinces.

Table No. 9.—Showing number of persons killed per 1,000 employed in the coal mines of North America, by states and provinces, from 1900 to 1909, inclusive, and for the ten year period, 1900-1909.

Table No. 10.—Showing number of fatal accidents in the coal mines of North America in 1909, compared with the average for the five preceding years, the death rate per 1,000 employed, and the rate of increase or decrease per 1,000 employed, by states.

Table No. 11.—Showing a twenty-five-year record of fatal accidents in the coal mines of North America, from 1885 to 1909, inclusive, and the average accident rate for each quinquennial period, and the average accident rate as a whole.

Table No. 12.—Showing fatal accidents in the principal coal mining couneries of the world, 1899-1908.

Table No. 13.—Showing rate of persons killed per 1,000 employed in the principal coal mining countries of the world, 1899-1908.

Table No. 12.—Showing fatal accidents in the principal coal mining countries of the per 1,000 employed, 1899-1908.

The statistical extracts embraced in tables 8, 9, 10, 11, 12, 13 and 14, are from an interesting article by Mr. Frederick L. Hoffman, an actuary and statistical expert, of Newark, N. J., appearing in the Engineering and Mining Journal of New York.

Note: In addition to the accidents herein enumerated, there were 5 fatal and 86 non-fatal accidents at the copper mines in Polk County. The fatal accidents were John Davis, R. L. Davis, Isaac Hefner, J. F. Little, and A. S. Poe.

FATAL ACCIDENTS

Table No. 1.—This table shows fatal accidents in Tennessee coal mines in 1910, arranged alphabetically by counties and mines, giving name and occupation of persons killed, experience in mining, and cause of accident.

Fatal accidents in Tennessee coal mines in 1910, *by counties and mines.*

Name of County and Mine	Name of Person Killed	Date of Accident	Occupation	Experience	Married or Single	Number of Children	Cause of Accident
Anderson Co.							
Black Diamond 5	S. M. Slover	Aug. 30	Miner	25 yrs.	M		Fall of roof.
Campbell Co.							
Block	Garfield Bashears	April 6	Miner	7 yrs.	M		Fall of roof.
Chaska	E. J. Ely	June 1	Miner	9 mos.	M		Fall of roof.
Caryville	Thomas Smith	Dec. 28	Miner	3 wks.	M		Powder explosion
Gem	Silas McNeilly	Feb. 9	Miner	4 yrs.	M	2	Fall of roof.
Red Ash	Will Brymer	Sept. 9	Miner	10 yrs.	M	2	Fall of roof.
Rex 1	Charles Header	Sept. 22	Miner	20 yrs.	M	4	Fall of roof
Southern	Angelo Bachetti	July 9	Miner	10 yrs.	M	2	Powder explosion.
Westbourne	Willie Hawkins	June 1	Miner	6 wks	S		Fall of roof
Claiborne Co.							
Buffalo	J. D. Thompson	April 12	Miner	3 mos.	S		Fall of roof.
Fork Ridge 2	Will Cheatham	July 12	Miner	6 yrs.	M		Fall of roof
Fork Ridge 3	Jim Long	June 23	Laborer	2 mos.	M		Incline
King Mt.	T. J. Hawkins	June 9	Miner	6 mos.	M	2	Fall of roof.
Nicholson 3	Alvis Minton	April 5	Miner	yrs.	M	3	Fall of roof.
Pruden	Will Shipman	July 17	Miner	12 yrs.	M		Fall of roof.
Sterling	Willie Wilson	June 11	Miner	1 year	M		Mine cars.
Sterling	Harry Woods	May 3	Miner	3 mos.	S		Fall of roof.
Cumberland Co.							
Clear Creek	Andy Padgett	Oct. 5	Miner	mos.	S		Fall of roof.
Clear Creek	Daniel Wyatt	April 30	Miner	4 mos.	M		Powder explosion.
Fentress Co.							
Fentress 1	James Bennet	June 27.	Miner	8 yrs.	M	1	Fall of roof.
Grundy Co.							
Coalmont O.	Isaac Turner	July 27	Miner	19 yrs.	M	4	Fall of roof.
Hamilton Co.							
Soddy 1-2	Hillis Roberts	Feb. 20	Laborer	7 yrs.	M	1	Dynamite explosion.
Marion Co.							
Battle Creek	Lee Hobbs	July 16	Miner	10 yrs.	M	2	Fall of roof.
Tenn. River	Will Barnes	May 14	Miner	1 (mos.	M	4	Dynamite explosion.
Tenn. River	Scott Newsom	May 14	Miner	6 mos.	M		Dynamite explosion.
Thomas	Mat Griffith	April 19	Miner	2 yrs.	M	2	Fall of roof.
Morgan Co.							
Big Brushy 1-2	Wash Lawson	April 12	Miner	3 days	M		Electric current.
Brushy Mt.	Luther Carroll	Feb. 15	Miner		S		Motor.
Brushy Mt	Killis Edmondson	Dec. 14	Miner	3 yrs.	M		Fall of roof.
Brushy Mt.	Will Edwards	June 3	Miner		S		Fall of roof.
Brushy Mt.	Wash Lawton	April 12	Miner	1 day	M	5	Electric current.
Brushy Mt.	Charles Stokes	July 26	Miner		S		Fall of roof.
Rhea Co.							
Richland	T. A. Smith	Sept. 28	Miner	25 yrs.	M		Dynamite explosion.
Roane Co.							
Old	John Sanders	June 2	Laborer	3 mos.	S		Mine cars.
Scott							
Paint Rock 3	J. F. Sexton	Dec. 23	Miner	10 yrs.	M	7	Powder explosion.
Paint Rock 3	Roe Sexton	Dec. 23	Miner	10 yrs.	M	6	Powder explosion
Paint Rock 3	Will Sexton	Dec. 23	Miner	10 yrs.	M	1	Powder explosion
White Co.							
Eastland	R. G. Ballard	Sept. 9	Miner	4 yrs.	M		Fall of roof.

RECAPITULATION OF FATAL ACCIDENTS

Table No. 2.—This table is a general recapitulation of fatal accidents in Tennessee coal mines in 1910, showing number by counties and districts, number by name of mine, and number by occupation and causes of accident.

Recapitulation of fatal accidents in Tennessee coal mines in 1910.

County	No.	Name of Mine	No.	Occupation	No.	Cause of Accident	No.
Anderson	1	Battle Creek	1	Laborers	3	Electric current	2
Campbell	8	Big Bushy 1-2	1	Miners	35	Dynamite explosion	4
Claiborne	8	Black Diamond 5	1			Fall of roof or coal	22
Cumberland	2	Block	1			Mine cars or motors	4
Fentress	1	Brushy Mt.	5			Powder explosion	6
Grundy	1	Buffalo	1				
Hamilton	1	Caryville	1				
Marion	4	Chaska	1				
Morgan	6	Clear Creek	2				
Rhea	1	Coalmont O	1				
Roane	1	Eastland	1				
Scott	3	Fentress	1				
White	1	Fork Ridge 2	1				
		Fork Ridge 3	1				
		Gem	1				
		King Mt	1				
		Nicholson 3	1				
		Old	1				
		Paint Rock 3	3				
		Pruden	1				
		Red Ash	1				
		Rex 1	1				
		Richland	1				
		Soddy 1-2	1				
		Southern	1				
		Sterling	2				
		Tenn. River	2				
		Thomas	1				
		Westbourne	1				
Total	38	Total	38	Total	38	Total	38

RECAPITULATION.

First District

Cumberland	2
Fentress	1
Grundy	1
Marion	4
White	1
Total	9

Second District.

Hamilton	1
Morgan	6
Rhea	1
Roane	1
Scott	3
Total	12

Third District.

Anderson	1
Campbell	8
Claiborne	8
Total	17
Grand Total	38

FATAL ACCIDENTS 1894-1910

Table No. 3.—This table gives miscellaneous statistics of fatal accidents in the coal mines of Tennessee from 1894 to 1910, inclusive, showing total number killed, number of wives made widows, number of children rendered fatherless, total average number of employes, number of employes to each life lost, total number of tons of coal mined, and total number of tons of coal mined to each employe.

General statistics of fatal accidents in Tennessee coal mines, 1894-1910.

YEAR	Number killed	Number of wives made widows	Number of children made fatherless	Total average number of employes	Average number of employes to each life lost	Coal mined (short tons)	Coal mined to each life lost (short tons)	Coal mined by each employe (short tons)
1894	12	6	16	5,542	461	2,180,879	181,740	393.52
1895	a37	19	50	5,120	138	2,319,720	62,695	453.07
1896	22	12	29	6,531	296	2,663,714	121,078	407.85
1897	10	6	13	6,337	633	2,880,994	288,099	454.63
1898	18	10	24	7,820	411	3,084,748	162,499	394.40
1899	20	11	27	7,694	384	3,736,134	186,806	485.50
1900	10	6	13	8,691	869	3,904,048	390,404	453.50
1901	b44	20	62	8,418	191	3,785,672	86,038	449.70
1902	c226	137	324	8,759	39	4,232,332	18,727	483.20
1903	26	13	26	9,673	372	4,810,758	185,029	499.40
1904	28	10	16	9,972	356	4,847,242	173,123	486.08
1905	29	13	30	10,517	363	5,552,576	191,468	527.96
1906	33	16	41	10,736	325	6,272,457	190,077	584.24
1907	31	19	51	11,098	358	6,940,911	223,900	625.42
1908	34	23	47	11,122	327	6,082,851	178,908	547.00
1909	31	18	32	10,946	343	6,207,483	200,241	567.08
1910	38	30	48	11,174	294	6,908,688	181,808	618.28

a Twenty-five of these were killed by coal dust explosion at the Dayton Coal & Iron Company mines, at Dayton.

b Twenty of these were killed in the explosion of the Richland mine at Dayton, operated by the Dayton Coal & Iron Company.

c Two hundred of these were killed in the explosion of Nelson and Fraterville mines at Coal Creek, operated by the Coal Creek Coal Company.

The fatal accident death rate in Tennessee, per 1,000 employed, in 1910, was 3.40 per cent, as against 2.83 per cent in 1909, and 3.05 per cent in 1908.

This increase is principally due to the increase in the number killed at the State mines at Petros. Eliminating all figures embracing the State operations, the death rate per 1,000 employed in 1910 was 3.07 per cent.

There was one person killed for every 294 employes in 1910, while in 1909 there was one person killed for every 343 employes.

There were 181,808 tons of coal mined for each life lost in 1910, while in 1909 there were 200,241 tons of coal mined for each life lost, and in 1908 there were only 178,908 tons of coal mined for each life lost.

Each employe produced 618 short tons of coal during 1910, whereas, during 1909 each employe only produced 567 short tons of coal.

NON-FATAL ACCIDENTS

Table No. 4.—This Table shows non-fatal accidents in Tennessee coal mines in 1910, by counties and mines, alphabetically arranged, name and occupation of person injured, and date, cause and extent of injury.

Non-fatal accidents in Tennessee coal mines in 1910, *by counties and mines.*

County and Mine	Name of Person Injured	Date of Accident	Occupation	Cause and Extent of Injury
Anderson County				
Black Diamond 1	Curtis Guess	Jan. 28	Miner	Fall of roof; 2 ribs broken.
Black Diamond 1	W. R. Leach	Nov. 9	Motorman	Collision; hip bruised.
Black Diamond 5	Henry Childs	Mar. 10	Timberm'n	Fall of roof; ankle cut.
Black Diamond 5	W. Kesterson	June 4	Miner	Fall of roof; hips bruised.
Black Diamond 5	John Strader	Jan. 10	Miner	Fall of roof; 4 ribs broken.
Brookside	Henry Duncan	Sept. 16	Trackman	Fall of roof; foot broken.
Buck Mt	Melvin Braden	Jan. 27	Yardman	Mine cars; ankle broken.
Buck Mt	Mike Brown	Mar. 16	Chuteman	Fall from steps; shoulder.
Buck Mt	John Higgins	May 21	Miner	Fall of roof; back sprained.
Cross Mt. 1	K. W. Cooper	Oct. 24	Miner	Fall of roof; finger cut.
Cross Mt. 1	R. M. Loving	June 21	Miner	Mine cars; finger cut.
Cross Mt. 1	Mike Marlow	May 23	Miner	Fall of roof; leg bruised.
Cross Mt. 1	Arthur Stipes	Jan. 8	Miner	Fall of roof; slight.
Cross Mt. 3	Geo. Griffith	Feb. 4	Miner	Fall of roof; shoulder bruised.
Cross Mt. 3	John Kup	Jan. 31	Driver	Mine cars; thumb.
Cross Mt. 3	Wiley Maiden	June 3	Miner	Fall of roof; hand crushed.
Cross Mt. 3	D. J. Ridings	May 16	Miner	Fall of roof; shoulder.
Cross Mt. 3	Thomas White	April 29	Miner	Fall of roof; leg bruised.
Fraterville	James Elliott	Nov. 2	Driver	Mule; collarbone broken.
Fraterville	Wiley Sharp	Dec. 27	Miner	Fall of roof; leg broken.
Middle Ridge	A. Duncan	Oct. 10	Miner	Fall of roof; hips and back.
Piedmont 2	A. Higdon	Sept. 7	Miner	Fall of roof; cuts on back.
Piedmont 2	W. Howard	Aug. 23	Laborer	Mine cars; arm cut.
Piedmont 2	Rufus Long	June 3	Miner	Mine cars; left hand.
Piedmont 2	J. H. Roberts	Aug. 29	Miner	Fall of roof; back.
Piedmont 2	G. Staples	Aug. 6	Miner	Fall of roof; neck cut.
Piedmont 2	Tom Staples	Apr. 25	Miner	Mine cars; hip bruised.
Piedmont 2	A. R. Walls	May 11	Miner	Mine lamp; one eye burnt.
Piedmont 2	F. M. Winningham	June 2	Miner	Mine car; back sprained.
Piedmont 2	John Wise	June 6	Miner	Mine car; arm dislocated.
Tennessee	Ed. Allen	Sept. 23	Laborer	Fall of roof; hand bruised.
Tennessee	Lucas Braden	Aug. 1	Driver	Mine cars; arm broken.
Tennessee	G. B. Carden	July 6	Foreman	Fall of roof; scalp.
Tennessee	A. Duncan	Oct. 10	Miner	Fall of roof; ribs.
Tennessee	Lige Duncan	Sept. 12	Driver	Mine cars; one finger cut.
Tennessee	Luther Macey	April 5	Driver	Mule; face bruised.
Tennessee	W. Payne	Jan. 21	Miner	Mine cars; finger mashed.
Tennessee	Walt Thurman	April 28	Miner	Fall of roof; leg bruised.
Tennessee	John Weaver	Oct. 3	Miner	Fall of roof; foot bruised.
Tennessee	J. A. White	Mar. 24	Miner	Ax in room; hand cut.
Windrock	B. Allison	June 20	Engineer	Fall off ladder.
Windrock	W. Burnett	July 14	Miner	Mine car; hand cut.
Windrock	Lee Carter	Oct. 22	Motorman	Trap door; ear cut off.
Windrock	J. H. Davis	July 5	Machine R	Mining machine; foot mashed.
Windrock	J. Freels	Dec. 19	Haulage	Mine cars; arm mashed.
Windrock	Frank Goodson	Sept. 7	Laborer	Motor; ankle sprained.
Windrock	John Gothard	July 22	Miner	Fall of roof; head cut.
Windrock	B. Hill	Aug. 3	Miner	Fall of roof; hip bruised.
Windrock	Robert Jones	June 9	Miner	Fall of roof, back sprained.
Windrock	John McNamara	Sept. 7	Laborer	Motor; ankle sprained.
Windrock	John Patterson	Feb. 16	Miner	Mine cars; finger cut.
Windrock	J. H. Scarbrough	Dec. 1	Miner	Fall of roof; leg cut.
Windrock	Rufus Seiber	April 23	Miner	Fall of roof; back and shoulder.
Windrock	George Smith	Feb. 17	Miner	Fall of roof; legs broken.
Windrock	Charles Wease	Nov. 24	Miner	Fall of roof; leg broken.
Windrock	W. Willoughby	July 4	Miner	Fall of roof; back sprained.

Table No. 4.—Non-fatal accidents in Tennessee coal mines in 1910—continued.

County and Mine	Name of Person Injured	Date of Accident	Occupation	Cause and Extent of Injury
Campbell County				
Anchor	Pete Harris	Oct. 26	Trackman	Fall of roof; 2 ribs broken.
Anchor	John Lambert	Mar. 28	Miner	Timbers; hip bruised.
Anchor	Kyle Williams	June 13	Knuckle	Mine cars; legs broken.
Cambria	Tom Clear	Feb. 9	Driver	Fall of roof; ankle dislocated.
Caryville	Samson Bess	Nov. 11	Miner	Fall of roof; ribs broken.
Caryville	Joe Ezell	Dec. 28	Laborer	Mine cars; leg cut off.
Caryville	John Ezell	Sept. 18	Miner	Powder explosion.
Chaska	E. Allred	July 18	Driver	Mine cars; thumb cut.
Chaska	Nathan Baty, Sr	Oct. 1	Miner	Powder explosion.
Chaska	J. M. Bolton	Nov. 28	Trackman	Fall of roof; face cut.
Chaska	Harlan Brown	April 20	Miner	Auger; thigh cut.
Chaska	C. Burchfield	July 6	Miner	Mine car; wrist sprained.
Chaska	Cas Smiddy	May 7	Driver	Mine cars; thumb.
Chaska	Frank Williams	April 13	Miner	Mine cars; ankle fracture.
Falls Branch	Eli Sordon	Feb. 14	Miner	Mine cars; 2 ribs fractured.
Falls Branch	Robert Lester, Jr	June 29	Miner	Fall of roof; arm and finger.
Falls Branch	William Lester, Jr	June 23	Miner	Pick coal; eye.
Gem	David Allen	Sept. 5	Haulage	Timber; leg broken.
Gem	C. J. Dougherty	May 25	Miner	Fall of roof; back and ankle.
Gem	Mark Johnson	May 28	Miner	Fall of roof; back and hips.
Gem	Albert Spears	Feb. 8	Miner	Fall of roof; back and leg.
Indian Mt	D. A. Beaver	Jan. 24	Miner	Fall of roof; lost hand.
Jackson	Tom Anderson	Jan. 17	Miner	Fall of roof; shoulder.
Jackson	Fletcher Brown	Dec. 27	Laborer	Mine cars, thumb cut.
Jackson	A. B. Loyd	Nov. 29	Miner	Mine cars, ear and scalp.
Jackson	Butler Manning	April 13	Driver	Mine cars; leg broken.
Jackson	George Mosley	Dec. 13	Miner	Fall of roof; slight.
Jackson	Charles Pate	Aug. 16	Driver	Timbers, foot bruised.
Kimberly	Sam Davis	Jan. 27	Miner	Fall of roof; toe broken.
Kimberly	William Gaylor	April 30	Driver	Mine cars; finger mashed.
Kimberly	Robert Kinley	Nov. 16	Miner	Fall of roof; shoulder bruised.
Kimberly	Henry Lee	Nov. 24	Driver	Mine cars; leg broken.
Kimberly	Stoke Rose	Feb. 14	Miner	Fall of roof; head bruised.
Kimberly	James Slavey	May 18	Miner	Slipped up; rib broken.
Kimberly	Joe Sneed	July 21	Miner	Fall of roof; breast bruised.
Kimberly	J. C. Sturdevant	Nov. 4	Driver	Mine cars; shoulder bruised.
Kimberly	W. B. Wiley	May 9	Miner	Fall of roof; knee mashed.
Layne	C. H. Hicks	May 26	Miner	Fall of roof; collar bone broken.
Marion-Anna	J. M. Williams	Nov. 28	Miner	Mine cars; chest bruised.
Powhattan	J. Kincaid	Jan. 27	Driver	Dump gate; lost finger.
Powhattan	R. B. Reeves	Jan. 10	Trackman	Mine cars; toe fractured.
Powhattan	Perry Woods	April 23	Miner	Fall of roof; shoulder cut.
Remy	Charles Ballou		Miner	Fall of roof; leg bruised.
Remy	Watson Thomas	Aug. 18	Miner	Fall of roof; back bruised.
Southern	Thos. Smith	April 10	Miner	Fall of roof; leg broken.
Southern	Nash Turner	April 5	Miner	Fall of roof; bruised.
Southern	John Cox	Dec.	Miner	Tipple; collar bone broken.
Tenn-Jellico	J. L. Casey	Feb. 26	Miner	Fall of roof; eye cut.
Tenn-Jellico	A. M. Clark	Nov. 10	Driver	Mine cars, eye cut.
Tenn-Jellico	A. C. Hoover	June 28	Miner	Fall of roof; leg broken.
Westbourne	W. E. Daniels	Dec. 7	Laborer	Railroad cars; back.
Westbourne	A. Hawkins	June 1	Miner	Fall of roof; leg broken.
Westbourne	Lee Fox	Dec. 10	Machine R	Fall of roof; back bruised.
Claiborne County				
Fork Ridge	Jess Allen	Jan. 14	Trackman	Fall of roof; thigh broken.
Fork Ridge	J. A. Baker	May. 2	Miner	Mine cars; arm broken.
Fork Ridge	Tom Caney	Oct. 21	Motorman	Mine cars, collar bone broken.

Table No. 4.—Non-fatal accidents in Tennessee coal mines in 1910—continued.

County and Mine	Name of Person Injured	Date of Accident	Occupation	Cause and Extent of Injury
Claiborne Co.-Con.				
Fork Ridge	H. E. Evans	Aug. 20	Miner	Fall of roof; leg broken.
Fork Ridge	Frank Nelson	Sept.19	Miner	Incline car; arm broken.
Fork Ridge	M. Thompson	Aug. 29	Miner	Fall of roof; ankle fractured.
King Mt.	J. P. Vanderpool	Dec. 14	Miner	Powder explosion; slight burns.
Nicholson 2	Dan Flower	Jan. 31	Laborer	Mine cars; leg dislocated.
Nicholson 3	James Farmer	Feb. 1	Driver	Mine cars; hand skinned.
Nicholson 3	Chas. Massengale	Jan. 18	Driver	Mine cars; hip bruised.
Nicholson 3	John Wood	July 29	Miner	Powder explosion; face burnt.
Pruden	Marion Adkins	July 17	Miner	Fall of roof; bruised.
Pruden	Alonzo Baker	Feb. 23	Motorman	Fall of roof; finger mashed.
Pruden	James Cregon	Nov. 15	Miner	Fall of roof; bruised.
Pruden	Oliver Hamlet	Dec. 31	Miner	Fall of roof; ankle and knee.
Pruden	W. R. Haynes	Aug. 28	Miner	Fall of roof; arm hurt.
Pruden	Jeff Henderson		Miner	Fall of roof; bruised.
Pruden	Fred Parkes	April 9	Miner	Fall of roof; ankle.
Pruden	John Thornton	Sept. 6	Miner	Fall of roof, leg broken.
Pruden	James Williams	April 14	Miner	Fall of roof; ankle and back.
Pruden	M. Wright	Sept.	Driver	Fall of roof; hand and finger.
Standard	John Boyd	Oct. 26	Laborer	Timbers; head bruised.
Standard	James Maiden	Nov. 16	Driver	Mule; face cut.
Standard	Wesley Pike	Nov. 25	Miner	Powder explosion; side bruised.
Yellow Creek	Ben Cochrane	Aug. 16	Motorman	Motor; hip and knee bruised.
Yellow Creek	Jake Crabtree	Oct. 25	Miner	Fall of Roof; back and ankle.
Yellow Creek	James Good	Sept. 30	Miner	Fall of roof; leg bruised.
Yellow Creek	R. Harman	Nov. 18	Miner	Fall of roof; eye cut.
Yellow Creek	Creed Lamar	Oct. 25	Carpenter	Incline car; neck and back.
Yellow Creek	George Laws	Sept. 8	Drumman	Incline car; foot and ankle.
Yellow Creek	Isham Moe	Dec. 26	Miner	Fall of roof; bruised.
Yellow Creek	Dan Smith	Oct. 24	Miner	Fall of roof; cheek and back.
Yellow Creek	Opp Whitaker	Nov. 7	Miner	Fall of roof; lost eye.
Fentress County				
Fentress 1	Beecher Elmore	Jan. 4	Haulage	Mine cars; leg broken.
Fentress 1	James Elmore	June 21	Miner	Mine cars; foot bruised.
Fentress 1	Edgar Gentry	Sept. 15	Driver	Mine cars; ankle.
Fentress 1	Thomas Kirklin	Feb. 5	Miner	Fall of roof; arm cut.
Fentress 1	T. Richards	Mar. 17	Haulage	Mine car; leg broken.
Grundy County				
Clouse Hill	Young Manders	Nov. 15	Miner	Fall of roof. dorsal dislocated.
Coalmont H	Bob Meeks	Nov. 26	Miner	Mine car; lost finger.
Coalmont H	H. Reaves	Jan. 25	Miner	Fall of roof; leg broken.
Coalmont O	Charles Rubley	Nov. 6	Blacksmith	Car at shop; ankle crushed.
Coalmont O	Isaac Turner	July 27	Miner	Fall of roof, contusion of bowels.
East Staub	Claud Fults	Mar. 24	Miner	Fall of roof; leg and back bruised.
East Staub	Dock Fults	Mar. 24	Miner	Fall of roof; side and back.
Ramsey	J. T. Jones	Mar. 21	Miner	Fall of roof; leg bruised.
Reid Hill	John Payne	Mar. 22	Driver	Tail chain; 3 fingers hurt.
Hamilton County				
Montlake	R. Emerlene	Oct. 4	Miner	Fall of roof; back, slight.
Montlake	S. C. Wright	Nov. 21	Miner	Powder explosion; burnt.
Soddy 1-2	Robert Brymer	Feb. 19	Laborer	Powder explosion; burnt.
Marion County				
Battle Creek	Lee Hobbs	July 16	Miner	Fall of roof; back bruised.
New Etna 3	Fred Degnan	June	Driver	Mine cars; hand mashed.
New Etna 3	Beane McNabb	June	Miner	Fall of roof; chest bruised.
Thomas	Per;y Ford	Sept. 9	Motorman	Motor, finger mashed.
Thomas	Ben Gerrin	Dec. 15	Haulage	Mine cars, foot caught.
Thomas	Ed Griffith	Dec. 16	Driver	Motor; finger mashed.

Table No. 4.—Non-fatal accidents in Tennessee coal mines in 1910—continued.

County and Mine	Name of Person Injured	Date of Accident	Occupation	Cause and Extent of Injury
Marion Co.—Con.				
Thomas	A. Hamilton	Jan. 11	Miner	Fall of roof; leg broken.
Thomas	W. H. Jaco	June 6	Tippleman	Bumper; finger broken.
Thomas	Willie Keith	Jan. 12	Brattice	Dynamite cap; lost 3 fingers.
Thomas	Pete Murphy	Dec. 11	Motorman	Mine cars; elbow bruised.
Thomas	Pete Murphy	Dec. 19	Motorman	Switch lever; hand broken.
Thomas	Jim Perkins	April 5	Driver	Mine cars, leg bruised.
Thomas	Grover Picket	Jan. 7	Miner	Pick; hand cut.
Thomas	Will Pickett	Nov. 28	Miner	Mine car; thigh hurt.
Thomas	Will Potter	May 19	Miner	Timber; ankle spralned.
Thomas	John Queen	Dec. 26	Driver	Chain; finger mashed.
Thomas	Jim Rains	May 24	Driver	Mine cars; leg bruised.
Thomas	John Riding	Dec. 20	Miner	Fall of roof; back bruised.
Thomas	Scott Terry	Nov. 28	Miner	Fall of roof; hip and shoulder.
Morgan County				
Big Mt	Tom Williams	Feb. 4	Miner	Fall of roof; ankle sprained.
Bowling	Walter Jackson	Sept. 21	Miner	Mine cars, thumb broken.
Bowling	Fred Wray	Oct. 23	Miner	Mine cars, finger.
Brushy Mt. 1	Dudley Jones	Feb. 1	Miner	Fall of roof; foot bruised.
Brushy Mt. 3	Henry Wilson	May 3	Miner	Powder explosion; burnt.
Little Brushy	Joe Taylor	Nov. 25	Miner	Fall of roof; legs and back.
Poplar Creek	Charles Eadmond	Feb. 17	Miner	Fall of roof; bruises.
Poplar Creek	Sam Jackson	April 28	Miner	Fall of roof; leg fracture
Overton County				
Brier Hill	Will Sweeton	April 29	Motorman	Motor; finger mashed.
Brier Hill	W. S. Wilson	Jan. 6	Miner	Fall of roof; leg bruised.
Rhea County				
Prospect	Isaac Blaylock	Sept. 7	Miner	Fall of roof; arm and face.
Prospect	Wesley Burrell	Jan. 11	Haulage	Mine cars; knee bruised.
Prospect	Andy Holder	May 16	A-Foreman	Mine cars: leg broken.
Prospect	Jim Pogue	Jan. 31	Miner	Fall of roof; foot crushed.
Prospect	J. C. Pressnell	July 20	Foreman	Mine cars; hip and shoulder.
Prospect	J. M. Riggs	Aug. 29	Miner	Fall of roof; face and back.
Richland	George Hibbs	Nov. 28	Driver	Mine car; thumb lost.
Richland	Dan Moonyhan	Aug. 19	Miner	Mine cars, eye hurt.
Roane County				
Old	Cal Bevins	Jan. 12	Miner	Arm broken by fall.
Old	Walter East	Nov. 21	Miner	Gas explosion; neck burnt.
Old	Geo. Foland	Feb. 24	Miner	Fall of roof; arm broken.
Old	John Hughes	Jan. 27	Miner	Arm broken by fall.
Old	R. R. Kelly	Dec. 19	Miner	Fall of roof; head cut.
Old	Will McPherson	Nov. 21	Miner	Gas explosion; face and hands.
Old	Walter Scott	Nov. 21	Miner	Gas explosion; neck and hand.
Old	Mont Stewart	Nov. 21	Miner	Gas explosion; burnt.
Scott County				
Glen Mary	Dan Phillips	Sept. 10	Miner	Mine cars; thigh broken.
White County				
Bon Air (shaft)	Jeff Hodge	Oct. 30	Laborer	Fall of roof; back and chest.
Bon Air 6	Sterling Starks	Nov. 28	Trackman	Fall of roof; leg broken.
Clifty Creek 3	J. Robbins	Feb. 2	Miner	Fall of roof; leg bruised.
Clifty Creek 3	S. P. Simmons	Jan. 24	Miner	Fall of roof; head, slight.
Eastland	Charles Scott	Jan. 6	Driver	Mine cars; slight fracture.

RECAPITULATION OF NON-FATAL ACCIDENTS

Table No. 5.—This table is a general recapitulation of non-fatal accidents in Tennessee coal mines in 1910, showing number by counties, number by mines, number by occupation and number by causes of accident.

Recapitulation of non-fatal accidents in Tennessee coal mines in 1910.

County	No.	Name of Mine	No.	Occupation	No.	Cause of Accident	No.
Anderson	56	Anchor	3	Blacksmiths	1	Falling roof or coal	104
Campbell	53	Battle Creek	1	Bratticemen	1	Gas and coal dust explosions	4
Claiborne	33	Big Mt	1	Carpenter	1	Powder explosions	8
Fentress	5	Black Diamond 1	2	Chutemen	1	Mine cars a.d motors	63
Grundy	9	Black Diamond 5	3	Drummen	1	Mining Machines	1
Hamilton	3	Bon Air Shaft	1	Engineers	1	Mule	3
Marion	19	Bon Air Six	1	Foremen	3	Timbers	5
Morgan	8	Bowling	2	Haulage	34	Tipple	1
Overton	2	Brier Hill	2	Knuckle	1	Minor causes	21
Rhea	8	Brookside	1	Laborers	11		
Roane	8	Brushy Mt. 1	1	Machine run's	2		
Scott	1	Brushy Mt. 3	1	Miners	135		
White	5	Buck Mt	3	Motormen	9		
		Cambria	1	Timbermen	1		
		Caryville	3	Tipplemen	1		
		Chaska	7	Trackmen	6		
		Clifty Creek 3	2	Yardmen	1		
		Clouse Hill 1-2	1				
		Coalmont H	2				
		Coalmont O	2				
		Cross Mt. 1	4				
		Cross Mt. 3	5				
		Eastland	1				
		East Staub	2				
		Falls Branch	3				
		Fentress	5				
		Fork Ridge	6				
		Fraterville	2				
		Gem	4				
		Glen Mary	1				
		Indian Mt	1				
		Jackson	6				
		Kimberly	9				
		King Mt	1				
		Layne B. G	1				
		Little Brushy	1				
		Marion-Anna	1				
		Middle Ridge	1				
		Montlake	2				
		New Etna 3	2				
		Nicholson 2	1				
		Nicholson 3	3				
		Old	8				
		Piedmont	9				
		Poplar Creek	2				
		Powhattan	3				
		Prospect	6				
		Pruden	10				
		Ramsey	1				
		Reid Hill	1				
		Remy	2				
		Richland	2				
		Soddy 1-2	1				
		Southern	3				
		Standard	3				
		Tennessee	10				
		Tenn-Jellico	3				
		Thomas	16				
		Westbourne	3				
		Windrock	16				
		Yellow Creek	9				
Total	210	Total	210	Total	210	Total	210

FATAL AND NON-FATAL ACCIDENTS BY CAUSES

Table No. 6.—This table shows causes of fatal and non-fatal accidents in Tennessee coal mines in 1910 by counties:

Causes of fatal and non-fatal accidents in Tenessee coal mines in 1910.

COUNTY	Fall of Roof or Coal		Gas & Dust Explosions		Mine Cars and Motors		Powder Explosions & Windy Shots		Other Causes		Total	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
Anderson	1	31	0	0	0	17	0	0	0	8	1	56
Campbell	6	26	0	0	0	16	2	2	0	9	8	53
Claiborne	6	19	0	0	2	6	0	3	0	5	8	33
Cumberland	1	0	0	0	0	0	1	0	0	0	2	0
Fentress	1	1	0	0	0	4	0	0	0	0	1	5
Grundy	1	6	0	0	0	1	0	0	0	2	1	9
Hamilton	0	1	0	0	0	0	0	2	1	0	1	3
Marion	2	5	0	0	0	8	0	0	2	6	4	19
Morgan	3	5	0	0	1	2	0	1	*a* 2	0	6	8
Overton	0	1	0	0	0	1	0	0	0	0	0	2
Rhea	0	3	0	0	0	5	0	0	1	0	1	8
Roane	0	2	0	4	1	1	0	0	0	1	1	8
Scott	0	0	0	0	0	1	3	0	0	0	3	1
White	1	4	0	0	0	1	0	0	0	0	1	5
Total	22	104	0	4	4	63	6	8	6	31	38	210

a Electric Current.

Table No. 7.—In this table is shown the causes of fatal and non-fatal accidents in the coal mines of the United States in 1909, by states:

Causes of fatal and non-fatal accidents in the coal mines of the United States in 1909.

STATES	Falls of Roof or Coal		Gas & Dust Explosions		Powder Explosions & Windy Shots		Other Causes		Total	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
Alabama	70	20	24	15	10	4	25	20	129	59
Alaska	0	0	0	0	0	0	0	0	0	0
Arkansas (6 mos.)	0	14	6	5	3	0	3	15	12	34
California	0	0	0	0	0	0	0	0	0	
Colorado	64	70	15	13	1	2	15	31	95	116
Georgia *a*	2	22	0	0	0	3	0	31	2	56
Illinois	84	420	40	25	29	38	60	408	213	894
Indiana	25	331	7	32	3	25	15	691	50	1,079
Iowa	22	49	1	0	1	1	13	53	37	103
Kansas *b*	21	50	6	24	4	3	4	14	35	91
Kentucky	20	43	7	1	0	3	7	51	34	98
Maryland *b*	13	47	0	0	0	0	4	29	17	76
Michigan	0	0	0	0	0	0	0	0	*c* 9	*c* 104
Missouri	14	17	0	0	3	2	4	4	21	23
Montana	8	20	0	2	1	2	2	20	11	44
New Mexico	9	31	0	0	0	0	4	146	13	177
North Dakota	0	2	0	0	0	0	0	0	0	2
Ohio	70	331	1	15	7	15	37	332	115	693
Oklahoma	4	33	24	24	2	0	10	50	40	107
Oregon	0	3	1	2	0	0	0	5	1	1
Pennsylvania:										
Anthracite	254	325	28	92	22	31	263	586	567	1,034
Bituminous	291	590	48	26	5	23	162	487	506	1,126
Tennessee	18	98	0	1	3	10	10	88	31	197
Texas	4	46	0	5	0	3	0	66	4	120
Utah	11	51	0	0	1	1	4	37	16	89
Virginia *d*	16	120	0	0	0	7	7	180	27	373
Washington	10	40	14	33	1	0	14	63	39	136
West Virginia *b*	144	504	119	16	10	44	91	468	364	1,032
Wyoming *b*	17	0	0	0	2	0	5	0	24	*c* 106
Total	1,191	3,280	341	331	108	217	759	3,875	2,412	7,979

a One company only. *b* Fiscal Year. *c* Causes not given.
d Includes 4 killed and 66 injured, 1 company causes not given.

FATAL ACCIDENTS IN NORTH AMERICA

Table No. 8.—This toble shows number of persons killed by accident in the coal mines of North America from 1900 to 1909, inclusive.

Fatal accidents in coal mines of North America, 1900-1909.

STATES TERRITORIES AND PROVINCES	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1900 TO 1909
Alabama	37	41	50	57	84	185	96	154	108	129	941
Colorado	29	55	73	40	89	60	88	99	61	99	693
Illinois	94	99	99	156	157	199	155	165	183	213	1,520
Indiana	18	24	24	55	34	47	31	53	45	50	381
Iowa	29	27	55	21	31	24	37	35	38	28	325
Kansas	20	10	30	36	a16	36	30	52	31	35	296
Kentucky	17	21	19	25	19	31	40	32	40	33	277
Maryland	7	12	11	16	12	16	13	5	12	19	123
Michigan	10	6	6	8	7	8	6	7	6	9	73
Missouri	10	15	10	17	11	11	16	8	10	21	129
Montana	6	7	12	5	9	8	13	14	21	12	107
New Mexico	15	9	17	17	15	5	9	31	34	18	170
Ohio	68	72	81	124	118	114	126	153	112	115	1,083
Oklahoma	40	44	60	33	30	44	39	32	44	40	406
Pennsylvania:											
Anthracite	411	513	300	518	595	644	557	708	678	567	5,491
Bituminous	265	301	456	402	536	479	477	806	572	506	4,800
Tennessee	10	44	226	26	28	29	33	31	34	31	492
Utah	209	9	8	7	9	7	7	8	8	16	288
Washington	33	27	34	25	31	13	21	37	25	39	285
West Virginia	141	134	120	159	140	194	269	356	625	364	2,502
British Columbia	17	102	139	42	37	12	15	31	18	57	470
Nova Scotia	21	14	19	31	19	20	28	35	39	33	259
Total deaths	1,507	1,586	1,849	1,820	2,027	2,186	2,106	2,852	2,744	2,434	21,111

a—Six months only.

FATAL ACCIDENT RATE IN NORTH AMERICA

Table No. 9.—This table shows number of persons killed per 1,000 employed in the coal mines of North America from 1900 to 1909, inclusive.

Fatal accident rates per 1,000 *employed in coal mines of North America,* 1900-1909.

STATES TERRITORIES AND PROVINCES	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1900 TO 1909
Alabama	2.59	2.90	2.79	2.94	4.77	10.75	5.23	7.61	5.75	6.40	5.28
Colorado	3.99	6.88	8.11	3.89	8.26	5.05	7.32	7.67	4.25	7.53	6.32
Illinois	2.39	2.24	2.15	3.13	2.87	3.36	2.49	2.47	2.58	2.93	2.69
Indiana	2.03	1.98	1.83	3.64	1.91	2.63	1.58	2.79	2.36	2.64	2.36
Iowa	2.22	2.05	4.23	1.59	1.90	1.36	2.20	2.05	2.20	1.56	2.09
Kansas	1.87	1.05	3.22	3.61	3.09	2.97	2.95	4.35	2.74	3.04	2.91
Kentucky	1.88	2.15	1.58	1.85	1.37	2.06	2.39	1.82	2.15	1.76	1.91
Maryland	1.32	2.23	1.89	2.82	2.11	2.57	2.10	0.85	2.00	3.34	2.13
Michigan	6.11	3.26	4.24	2.54	2.58	2.16	2.83	2.43	1.94	3.04	2.86
Missouri	1.31	1.63	1.09	1.85	1.09	1.06	1.65	1.70	1.06	2.31	1.46
Montana	2.53	3.24	6.19	2.32	3.59	3.67	5.43	5.12	6.68	3.11	4.20
New Mexico	7.44	4.81	10.11	7.26	7.61	2.35	3.82	10.13	9.26	5.57	6.99
Ohio	2.14	2.15	2.16	3.00	2.57	2.58	2.71	3.20	2.23	2 45	2.54
Oklahoma	2.59	8.35	9.62	5.42	3.63	5.76	4.81	4.15	3.02	2.76	4.85
Pennsylvania:											
Anthracite	2.86	3.47	2.03	3.41	3.69	3.83	3.35	4.19	3.89	3.31	3.43
Bituminous	2.44	2.56	3.36	2.65	3.44	2.90	2.76	4.40	3.15	2.72	3.08
Tennessee	1.15	5.23	25.80	2.69	2.81	2.76	3.07	2.79	3.06	2.77	4.91
Utah	138.96	5.06	3.24	3.21	4.06	3.57	3.69	3.07	2.99	5.36	12.93
Washington	7.79	5.59	7.83	5.13	6.69	2.61	4.08	6.05	4.68	6.81	5.68
West Virginia	5.03	4.14	3.41	4.03	3.08	3.88	5.20	6.33	10.35	5.85	5.43
British Columbia	4.22	25.67	34.65	9.85	8.31	2.72	3.12	5.12	2.95	8.88	9.69
Nova Scotia	3.17	1.83	2.36	2.79	1.63	1.86	2.31	2.89	3.02	2.73	2.46
Average	3.25	3.21	3.48	3.16	3.33	3.40	3.20	4.15	3.84	3.39	3.46

FATAL ACCIDENTS IN NORTH AMERICA

Table No. 10—This table shows fatal accidents in the coal mines of North America in 1909, compared with the five previous years, and corresponding rates per 1,000 employed, with increases and decreases.

Fatal accidents in coal mines in North America in 1909, *compared with the five previous years.*

STATES, TERRITORIES AND PROVINCES	No. of Persons Killed Yearly Average		Rate Per 1,000 Employed		Rate of Increase or Decrease Per 1,000 Employed
	1904-1908	1909	1904-1908	1909	
Alabama	125	129	6.80	6.40	−0.40
Colorado	79	99	6.41	7.53	+1.12
Illinois	172	213	2.74	2.93	+0.19
Indiana	42	50	2.25	2.64	+0.39
Iowa	33	28	1.94	1.56	−0.38
Kansas	33	35	3.25	3.04	−0.21
Kentucky	32	33	1.98	1.76	−0.22
Maryland	18	19	1.93	3.34	+1.41
Michigan	7	9	2.35	3.04	+0.69
Missouri	11	21	1.26	2.31	+1.05
Montana	13	12	5.02	3.11	−1.91
New Mexico	19	18	7.13	5.57	−1.56
Ohio	125	115	2.65	2.45	−0.20
Oklahoma	38	40	4.08	2.76	−1.32
Pennsylvania:					
Anthracite	636	567	3.79	3.31	−0.48
Bituminous	574	506	3.34	2.72	−0.62
Tennessee	31	31	2.85	2.77	−0.08
Utah	8	16	3.43	5.36	+1.93
Washington	25	39	4.84	6.81	+1.97
West Virginia	317	364	6.00	5.85	−0.15
British Columbia	23	57	4.38	8.88	+4.50
Nova Scotia	28	33	2.37	2.73	+0.36
Total	2,383	2,434	3.60	3.39	−0.21

Table No. 11.—This table shows a 25-year record of fatal accidents in the coal mines of North America from 1885 to 1909, inclusive; and average accident rate for each 5-year period, and average accident rate as a whole per 1,000 employed.

Fatal accidents in coal mines of North America 1885-1909.

YEAR	Number of Employes	Fatal Accidents	Accident Rate Per 1,000 Employed	YEAR	Number of Employes	Fatal Accidents	Accident Rate Per 1,000 Employed
1885	214,184	576	2.69	1902	530,624	1,849	3.48
1886	222,029	514	2.32	1903	576,365	1,820	3.16
1887	230,834	514	2.23	1904	609,001	2,027	3.33
1888	278,175	659	2.37	1905	643,225	2,186	3.40
1889	278,361	681	2.45	1906	658,880	2,106	3.20
1890	301,295	853	2.83	1907	686,460	2,852	4.15
1891	326,684	959	2.94	1908	715,355	2,744	3.84
1892	343,564	883	2.57	1909	717,317	2,434	3.39
1893	384,249	970	2.52				
1894	394,146	962	2.44	1885-1889	1,223,583	2,944	2.41
1895	404,553	1,061	2.62	1890-1894	1,749,938	4,627	2.64
1896	409,320	1,123	2.74	1895-1899	2,052,728	5,446	2.65
1897	409,830	956	2.33	1900-1904	2,674,512	8,789	3.29
1898	407,536	1,056	2.59	1905-1909	3,421,237	12,322	3.60
1899	421,489	1,250	2.97				
1900	464,235	1,507	3.25				
1901	494,287	1,586	3.21	1885-1909	11,121,993	34,128	3.07

FATAL ACCIDENTS IN FOREIGN COUNTRIES

Table No. 12.—Fatal accidents in the principal coal-mining countries of the world 1899-1908.

Number of persons killed.

COUNTRY	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1899 1908
Australia	16	34	22	107	15	15	27	21	19	26	302
Austria	156	224	181	196	103	110	183	155	161	145	1,614
Belgium	121	140	157	144	159	129	123	132	148	155	1,408
France	208	230	198	180	170	184	182	1,280	202	186	3,020
India	98	64	70	77	97	67	60	100	89	178	900
New Zealand	3	4	3	2	4	4	6	6	12	5	49
Prussia	869	948	1,078	914	909	894	919	1,005	1,318	1,593	10,447
United Kingdom	916	1,012	1,101	1,024	1,072	1,055	1,159	1,142	1,245	1,308	11,034
Total	2,387	2,656	2,810	2,644	2,529	2,458	2,659	3,841	3,194	3,596	28,774

Table No. 13.—Fatal accidents in the principal coal-mining countries of the world 1899-1908.

Rate of persons killed per 1,000 *employed.*

COUNTRY	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1899 1908
Australia	1.26	2.44	1.48	6.64	0.94	0.92	1.64	1.22	0.98	1.29	1.85
Austria	1.37	1.84	1.39	1.60	0.85	0.92	1.53	1.28	1.27	1.10	1.31
Belgium	0.97	1.05	1.17	1.07	1.14	0.93	0.91	0.95	1.04	1.07	1.03
France	1.35	1.42	1.21	1.09	1.02	1.07	1.04	7.17	1.10	0.95	1.76
India	1.32	0.71	0.73	0.78	1.13	0.72	0.67	1.01	0.79	1.38	0.93
New Zealand	1.39	1.63	1.09	0.69	1.40	1.22	1.84	1.63	3.07	1.28	1.57
Prussia	2.28	2.26	2.36	2.01	1.92	1.82	1.85	1.94	2.32	2.62	2.15
United Kingdom	1.26	1.30	1.36	1.24	1.27	1.24	1.35	1.29	1.32	1.32	1.30
Average	1.50	1.54	1.00	1.45	1.37	1.31	1.40	1.96	1.52	1.62	1.53

Table No. 14.—Fatal accidents in American and Foreign coal mines, 1899-1908.

Total number killed and rate per 1,000 *employed.*

YEAR	North America			Foreign Countries		
	Number of Employes	Number Killed	Rate per 1,000 Employed	Number of Employes	Number Killed	Rate per 1,000 Employed
1899	421,489	1,250	2.97	1,592,485	2,387	1.50
1900	464,235	1,507	3.25	1,723,362	2,656	1.54
1901	494,287	1,586	3.21	1,804,688	2,810	1.00
1902	530,624	1,849	3.48	1,820,914	2,644	1.45
1903	576,365	1,820	3.16	1,848,662	2,529	1.37
1904	609,001	2,027	3.33	1,882,206	2,458	1.31
1905	643,225	2,186	3.40	1,893,945	2,659	1.40
1906	658,880	2,106	3.20	1,958,516	3,841	1.96
1907	686,460	2,852	4.15	2,096,562	3,194	1.52
1908	715,355	2,744	3.84	2,212,312	3,596	1.62
1899-1903	2,487,000	8,012	3.22	8,790,111	13,226	1.48
1904-1908	3,312,921	11,915	3.60	10,053,541	15,748	1.57
1899-1908	5,799,921	19,927	3.44	18,843,652	28,774	1.53

WAGE SCALES

The wage scales of the following mines are under the supervision of the United Mine Workers of America, and were furnished the department by Mr. J. S. McCracken, Secretary and Treasurer, with offices at Rooms 1 and 2, Plaza Block, Knoxville:

Campbell County.
Falls Branch Coal Co., Wooldridge.
Wooldridge-Jellico Coal Co., Wooldridge.

Hamilton County.
Durham Coal and Iron Co., Chattanooga.
Montlake Coal Co., Chattanooga.

The contracts for Fall Branch and Wooldridge-Jellico Coal Companies are extensions to September 1, 1911, of an old contract made September 3, 1907, for the year ended September 3, 1908.

The contract for Durham Coal and Iron Company mines at Soddy is an extension to September 30, 1911, of an old contract made December 28, 1908, with but few minor changes.

The contract for Montlake Coal Company mines was made November 30, 1910, and expires April 1, 1912.

As to average wages paid miners and other employes in all coal mines in Tennesseee during 1910, special attention is directed to the table of statistics embraced in the report giving the average wages paid per day to each class of employes.

CAMPBELL COUNTY

FALLS BRANCH COAL CO. and WOOLDRIDGE-JELLICO COAL CO.

MINING.

Resolved, That the price for mining shall be as follows:

That in the Jellico district pick-mined screen coal shall be paid for on the following basis, per ton of 2,000 pounds in weigh box.

No. 1. Under 2½ feet	$1.01
No. 2. 2½ feet to 2 feet 9 inches	.94.3
No. 3. 2 feet 9 inches to 3½ feet	.87.5
No. 4. 3 feet 6 inches and over	.80.7
Run of mine shall be, per ton of 2,000 pounds	.56.44

YARDAGE.

The standard price of entries, either tight or gob, in the Jellico district shall be $2.30 per yard in slate, but when both top and bottom are blasted, the price shall be $2.90 per yard; solid rock entries, $3.25; rock top and slate bottom, $3.70. Entries, airways, and all narrow work in coal, when used for entries and airways, shall be $1.00 per yard. When the slate parting occurs in the coal, and neither top nor bottom is blasted, the price shall be $1.40 per yard, in entries and airways, when the slate is loaded out and does not exceed 9 inches in thickness; over 9 inches and up to 18 inches in entries and rooms, 4 4-5c extra per ton shall be paid on coal.

ROOM TURNING.

In high coal, $2.45; in medium coal, $2.75; in low coal, $3.05; for double rooms in all coal $4.55.

DAY LABOR.

Classification.	Rate per hour	Rate per day
Inside driver, one mule	21.42c	$1.93
Drivers, two mules	23.10c	2.08
Drivers, three mules	24.25c	2.17
Drivers, four mules	25.30c	2.27
Head track layer	30.18c	2.71
Assistant track layer	21.42c	1.93
Trappers	7.61c	.68
Timberman	27.29c	2.44
Timberman helper	21.42c	1.93
Inside pumper and water bailer	21.42c	1.93
Motormen	27.40c	2.47
Motormen couplers (gathering)	23.31c	2.10
Motormen couplers (main haul)	21.42c	1.93
Practical miners called to company work	27.40c	2.47
Machine runner	29.08c	2.63
Machine hostler (chain)	26.25c	2.36
Machine hostler (punch)	21.42c	1.93
Outside pumper and water bailer	20.05c	1.81
Muckers, or inside labor	20.05c	1.81
Coupler man, inside	18.90c	1.70
Coupler man, outside	15.04c	1.35
Coupler boy, inside	9.76c	.88
Coupler boy, outside	7.56c	.68
Tip house man	20.05c	1.81
Drum man	22.59c	2.04
Knuckle man	20.05c	1.81
Knuckle boy	15.04c	1.35
Furnace man (digging his own coal)	22.59c	2.04
Furnace man and watchman	16.38c	1.47
Outside labor, including slate dumpers	15.04c	1.35
Blacksmith	26.35c	2 36
Pick sharpener	22.59c	2.04

Outside driver, 10c per day less than inside. Boy driver under 16 years of age, 35c per day less than regular prices.

IMPURITIES.

Any miner loading an unusual amount of dirt, slate, sulphur, or other impurities with his coal shall be laid off one day for each offense. The company's representatives will, on all such occasions, show such unusual amount. Any miner laid off for three days during any one month shall then be subject to discharge; provided, however, that no dirt, slate, sulphur, or other impurities shall be included in the measurements to determine the height of coal.

TIMBERING.

Present conditions as to timbering shall continue at all times.

TRACKS.

In addition to the iron tracks now being used, the dip places where men have to push the cars shall be provided with iron rails.

CARS.

All cars are to be handled the same as last year, but it is understood that this clause shall not be construed to have miners handle cars where it has been customary for the company to handle them heretofore.

Rents, house fuel, pick sharpening at each mine shall remain without change during the life of this contract.

HOURS.

SECTION 1. Nine hours shall constitute a day's work for all classes of labor for which a scale of wages is made in this contract.

SEC. 2. A nine-hour day means nine hours' work in the mines at the usual working place for all classes of day labor and miners. This shall be exclusive of the time required in reaching the working place and departing from the same at night.

DRIVERS.

Drivers shall take their mules to and from the stable, and the time in so doing shall not include any part of the day's work.

It is distinctly understood that the time for starting each day depends on the arrival of railroad cars, providing the run begins in two hours from the regular starting time. Pay to begin with work, and work to stop at the regular quitting time.

PAY DAY.

Payment of wages shall be semi-monthly. The pay day being on or before the last day of each month, for the work performed during the first half of the month; and on or before the 15th of the succeeding month, for work performed during the last half of the month; but it is understood that statements shall be made only once for each month. The semi-monthly pay being the last in each month to be paid in even dollars. An employe desiring to leave the employment of the company shall receive his money at once, or not later than five days after his notice is given.

CUT.

All employes whose wages are regulated by this scale shall be cut for dues and assessments, through the office, out of the first five days' work performed in each month, the same to be paid to the proper person or persons authorized to receive the same. The dues and assessments not to exceed $1.00 per month, without the special written order of each employe. Initiation fees are hereby guaranteed to be uniform throughout District No. 19, and that the payment of same shall be prorated through sixty days if necessary.

TURN.

A square turn shall be kept all over the mine, in rooms and narrow work under ordinary conditions. Miners absenting themselves from their working places for three consecutive days without first obtaining the consent of the superintendent or bank boss, shall forfeit their working places, except in cases of sickness of themselves or any member of their family, and except also representatives of the organization engaged in work of the organization, in which case they must notify the superintendent or bank boss. Work shall not stop at any mine on any day other than on general holidays, and on April 1, without previous agreement with the management of such mine.

NOTE—See also special provisions applying to each operating cempany.

HAMILTON COUNTY

DURHAM COAL AND IRON CO. Successors to the New Soddy Coal Co.

(Entire contract and rules.)

The New Soddy Coal Company and the miners and other employes of said company, through their Executive Committee appointed by them to act for them, and the

officials of the United Mine Workers of America, hereby adopt as the agreements for the ensuing nine months, ending September 30, 1909, the following, viz.:

First—Nine hours shall constitute a day's work for all classes of labor, for which a scale of wages is made in this contract. A nine hour day means nine hours' work in the mines, at usual working place, for all classes of day labor and miners. This shall be exclusive of the time required in reaching the working place and departing from the same at night. The drivers shall take their mules to and from the stable, and the time in so doing shall not be included in any part of the day's work. An accommodation trip will be run in No. 1 mine, starting at 6:30 a. m. Firing time for less than a full day to be 30 minutes after run stops. For a full day firing time will be 4 p. m.

Second—Two thousand pounds shall constitute a ton. Prices for mining shall be as follows, viz.:

Coal 36 inches and over.....45c per ton
Coal 30 to 36 inches.....51c per ton
Coal 24 to 30 inches.....55c per ton
Coal 18 to 24 inches.....65c per ton
Pillar coal .....51c per ton

Third—Yardage prices shall be as follows, viz.: The standard price of entry, either tight or gob, will be $1.85 per yard for 5 feet high and 8 feet width of roadway; $2.55 per yard for 5 feet 6 inches high and 8 feet of roadway. When the coal is under 24 inches in thickness, $4.05 per yard; airways, 50c per yard. Billie rib yardage, 72c in coal only; cut throughs, 45c per yard; but when more than 18 feet of solid coal is cut, special price. When rooms are turned 9 feet wide and 16 feet in depth of neck, $3.25 per room; wet places to be paid 2c per ton extra. Only such places shall be termed wet in which the water will run from drill holes when bored horizontally and in proper place, or when water stands at face so as to require bailing. Cut throughs to be measured from one road prop to far side of coal.

WAGE SCALE.

Classification.	Per hour.	Per day.
Driving single mule	21.4c	$ 1.93
Driving two mules	23.1c	2.08
Driving three mules	24.3c	2.17
Driving four mules	25.3c	2.27
Boss track layer	30.2c	2.71
Assistant track layer	21.4c	1.93
Trappers	7.6c	.68
Sheavemen, inside	21. c	1.89
Sheavemen, outside	18.9c	1.70
Rope rider, inside	25.6c	2.30
Rope rider, outside	15.7c	1.42
Inside labor, on rock	18.3c	1.65
Engineers (per month)		51.45
Firemen	17.4c	1.57
Outside labor	13.6c	1.23
Inclinemen	15.7c	1.42
Dumpers	15.1c	1.36
Tipplemen	18.1c	1.63
Blacksmith	26.2c	2.36

Pick sharpeners	22.5c	2.03
Blacksmith helpers	16.3c	1.47
Washerman	20.3c	1.83
Fireman at washer	18.9c	1.70
Labor on coke yard	14. c	1.26
Charging coke ovens	3.5c per oven.	
Pulling ovens	33c, 37c, 39c per oven	
Night watchman		1.57

Outside driver, 10c per day less than inside. Boy driver under 16 years of age, 35c per day less than regular rates.

Fourth—Any miner called upon to do company work shall be paid at the rate of 24 4-10c per hour, or $2.20 per day.

Fifth—Pay-day shall be on the second Saturday of each month for work done last half, and on last Saturday for work done on the first half of the month. Men absenting themselves from work on the first day of any month, or on the Monday succeeding pay-day, will be discharged.

Sixth—Blacksmithing will be 35c per month per turn. This is to cover the sharpening and dressing of tools only.

Seventh—Cut—all employes whose wages are regulated by this scale shall be cut for dues and assessments through the office out of the first five days' work performed in each month, the same to be paid to the proper person or persons authorized to receive the same; the dues and assessments not to exceed $1.00 per month without special written order of each employe. Initiation fees are hereby guaranteed to be uniform throughout District No. 19, and that the payment of same shall be prorated through sixty days, if necessary.

Eighth—House coal to be as follows: Lump coal, $2.50 per ton; nut coal, $1.50 per ton, and run of mine coal $1.00 per ton, in town limits.

Ninth—No committee shall visit any man at his working place except when accompanied by the mine foreman, and then only to settle a grievance.

Tenth—It is fully understood and agreed by the parties to this agreement that all employes of this company are required to work six days per week, when called on to do so, excepting legal holidays, half days on pay-days, and April 1. Any employe desiring to be idle for a day must secure permission of his foreman in advance, unless prevented by sickness or other unavoidable cause. Any employe being idle without notifying his foreman shall, for the first offense, be suspended from work three days; for the second offense be suspended for five days; and any one being idle more than three days in any one month may be suspended for one month, or discharged.

Eleventh—If any differences arise between the operator and the miner, or between the operator and any of the employes of the mine, settlement shall be arrived at without stopping work. If the parties immediately affected can not reach an agreement between themselves, the question shall be referred without delay to the local committee and the company's officials. If they fail to affect a settlement, it shall be referred to the officials of District No. 19, United Mine Workers of America, and the officials of the company. If they fail to adjust the grievance, it shall be referred to a Board of Arbitration, composed of one or two persons from each side, with power to select an umpire. Their decision shall be final and binding on all parties to this agreement and those they represent. Arbitrators shall be appointed within three days after the case is submitted to their arbitration, and they shall proceed within five days to hear and determine the case. In the event the arbitrators be unable to select an umpire within fifteen days after their appointment, Judge M. M. Allison is to select an umpire from three names submitted by each respective side.

The operator and his superintendent and mine manager shall be respected in the management of the mine and in direction of the working force. All day men shall perform whatever kind of day labor the management may direct them to perform from time to time. The right to hire includes the right to discharge, and it is not the purpose of this agreement to abridge the right of the employer in either of these respects. If, however, any employe shall be suspended or discharged by the company, and it is claimed that an injustice has been done him, an investigation shall be conducted as herein provided, and if it is determined that an injustice has been done, the operator agrees to reinstate said employe.

On September 21, 1909, this contract was extended to September 30, 1910, with an additional provision requiring the New Soddy Coal Co. to handle the water in working places when in such quantity as to require bailing.

Witness our hands this the 18th day of December, 1908.

NEW SODDY COAL COMPANY,
J. H. JONES, *Engineer in Charge.*

D. A. Bell, Lige Eustice, T. M Gann, Phil Lynch, George Branham, Pat Cary, Vice President of District No, 19, and T. J. Smith, N. B. M., U. M. W. of A.—Scale Committee.

MINING RULES.

The following mining rules were adopted by and between the New Soddy Coal Company and officials of the U. M. W. of A.:

1. Starting time, 7 a. m. Quitting time, 4 p. m. Any violation of this rule, suspension of turn for one day; second violation, suspension for three days; third violation, discharged.

2. Miners and mine laborers will be taken in and out of the mine by an accommodation trip. When mines work full day, the accommodation trip will leave Clayton side track at 4:15 p. m. When mines work less than a full day, the trip will leave 45 minutes after the suspension of work. Men riding this trip will be at their own risk.

3. Blacksmiths shall have all tools sharpened by 6:30 a. m. that are delivered at the shop the day before.

4. When slate falls on the roadway it shall be removed without delay; and if delay be made, the miner shall be permitted to remove the same, being paid at the rate of $2.20 per day.

5. A square turn shall be kept in all mines.

6. That there shall be an allowance of three cars per turn in preparing roadway. No miner shall prepare his room for roadway without permission of the Mine Foreman, unless the face is fifteen (15) feet in advance of the roadway, in which case he must notify the Mine Foreman by registering same at the Mines Depot. After said notice has been given, the roadway must be prepared within the period of two (2) days, unless prevented from so doing by some unforeseen occurrence. In case of failure to take such top or bottom, the miner to be given employment by the company and paid at the rate of $2.20 per day until said roadway has been completed.

7. Equal rights to all and special privileges to none.

8. That no man be compelled to work double in rooms.

9. Any company man competent to mine coal, and applying for the same, shall have preference in employing miners.

10. The company shall help handle cars in rooms to rise where they can not be handled by the miner.

11. In case of death of an employe or member of his family, the following rule will prevail:

Death by accident in or around the mine, the mines shall remain idle until after the funeral; death from natural causes of an employe or member of his family, the

work shall not be idle, but any desiring to attend the funeral may do so, but not otherwise.

12. Docks for slate: For the first eight (8) pounds, dock will be fifty (50) pounds; for each additional two (2) pounds, an additional fifty (50) pounds. When docks equal 2,000 pounds in any one day the miner will be discharged.

13. All wrecked cars and cars for boilers to be given average weight, same to be decided by company and Check Weighman.

14. No miner shall be allowed in the mines on idle days, unless engaged in company or special work. In case of the mines being idle by reason of insufficiency of men reporting for work, those miners reporting for work on such days are permitted to work.

15. The company shall at all times keep within reasonable distance all necessary timber, miners to place on road, properly marked with number and entry, the boss driver to see that they are promptly delivered the same day to party marked for.

16. Employes will be discharged for the following reasons: (1) Disorderly conduct or drunkenness. (2) Gambling or shooting on company property. (3) Taking coal, timber or tools without permission, or changing tickets on cars. (4) Firing before stipulated time without permission of the mine foreman. (5) Committing a nuisance in entries, airways or rooms necks. (6) Riding on loaded trips without permission of the mine foreman. (7) Leaving air or trap door open.

17. No laborer, who is not on company work, will be allowed any turn, except entrymen and sons of employes and dependent widows' sons, they to be allowed one-half turn under 16 years of age, and full turn over 16 years of age.

18. No room shall be turned off another room, except to secure coal that can not be reached by an entry or air course.

19. Any party or parties intentionally violating the foregoing rules will be discharged.

HAMILTON COUNTY

MONTLAKE COAL COMPANY.

The Montlake Coal Company and the miners and other employes of said company, through their Executive Committee appointed by them, to act for them, and the officials of the U. M. W. of A., hereby adopt as the agreement for their government from January 1, 1911, and until April 1, 1912, as follows, to-wit:

WAGE SCALE.

Coal over 40 in.	.50c	Per ton of 2,000 lbs. clean, merchantable coal, with as much lump as is reasonably possible to produce. When the coal is properly undermined for shooting and when shot on the solid, then 5c per ton less.
Coal 36 to 40 in.	.55c	
Coal 30 to 36 in.	.60c	
Coal 24 to 30 in.	.67c	
Below 24 in.	Special	
Drawing Pillars	.56c	
Drawing Entry Stumps	.55c	

NOTE—The company's present rule as to depth of mining and burden to govern.

Narrow entries—size 5½x8	Per Yard	$2 25
Gob entries (to be shot in the tight)—size 5½x8	Per Yard	2 00
Haulway—size 6x9	Per Yard	2 50
Air course in coal—size as directed by foreman	Per Yard	50
B rushing—to give not less than one foot over cars	Per Yard	40
Room turning—consisting of neck 8 ft. wide by 15 to 21 ft. deep—with top brushed same distance and room widened to 42 ft. at face	Per Yard	4 50
Miner (when called from his work place)		2 25

Locomotive engineer		2 00
Trainmen		1 25
Trackmen (outside)		1 15
Inside track and brattice man		2 00
Inside track and brattice man (helper)		1 50
Tipple men and general outside work		1 25
Drum man		2 00
Blacksmith		2 35
Helper		1 25
Pump and rollers	Per Month	45 00
Tail rope engineer		2 25
Tail rope fireman (steam up to blow call whistle at 6:00 A.M.)		1 50
Fan fireman (5:00 A.M. to 5:30 P.M.)		1 50
Shaker engineer (6:00 A.M. to 5:00 P.M.)		1 35
Rope rider		2 20
Helper		1 75
Mule driver (inside)		1 80
Mule driver (outside)		1 70
Greaser and coupler		72
Trapper boys		60
Hand pumper and inside laborers		1 50

No free oil, and above wages are for practical men only, and are not for inexperienced help.

The bank committee will remove the tools from the work places of miners who have forfeited their claim to the place when called upon by the mine foreman to do so.

No grievance is to be considered without the mine foreman and superintendent being present at the conference and giving their version.

DOCKS FOR SLATE.

For the first eight (8) pounds, dock will be fifty (50) pounds, for each additional two (2) pounds, an additional fifty (50) pounds. When docks equal 2,000 pounds in any one day, the miner will be discharged

Should the company decide to install mining machines at any time during the life of this contract, and terms of employment can not be agreed upon, then this contract can be declared void, without let, hindrance or interference.

CONSTRUCTION WORK.

The erection of tipple houses, buildings, development of the coal, installation of machinery, construction of railroad sidetrack necesssary for the completion of plans for operation, all being in the nature of temporary employment in construction and development work, as well as carpenters, stablemen, timbermen, and the employes of the Chattanooga & Montlake Railway Company, are to be excluded from the jurisdiction of the wage scale.

CUT.

All employes whose wages are regulated by this scale, shall be cut for dues and assessments through the office out of the first five days' work performed in each month, the same to be paid to the proper person or persons authorized to receive the same. The dues and assessments not to exceed $1.00 per month, without special written order of each employe. Initiation fees are hereby guaranteed to be uniform throughout District No. 19, and that the payment of same shall be prorated through sixty (60) days if necessary.

No committee shall visit any man at his working place, except when accompanied by the mine foreman, and then only to settle a grievance.

It is fully understood and agreed by the parties to this agreement that all employes of this company are required to work six days per week, when called on to do so, excepting legal holidays, half days on pay days, and April 1st. Any employe desiring to be idle for a day must secure permission of his foreman in advance, unless prevented by sickness or other unavoidable cause. Any employe being idle without notifying his foreman shall, for the first offense be suspended from work for three days; for the second offense, be suspended for five days; and any one being idle more than three days in any one month may be be suspended for one month or discharged.

If any differences arise between the operator and the miner, or between the operator and any of the employes of the mine, a settlement shall be arrived at without stopping work. If the parties immediately affected can not reach an agreement between themselves, the question shall be referred without delay to the local committee and the company's officials. If they fail to effect a settlement, it shall be referred to the officials of District No. 19, U. M. W. of A., and the officials of the company. If they fail to adjust the grievance, it shall be referred to a board of arbitration, composed of one or two persons from each side, with power to select an umpire. Their decision shall be final and binding on all parties to this agreement and those they represent. Arbitrators shall be appointed within three (3) days after the case is submitted to arbitration, and they shall proceed within five (5) days to hear and determine the case. In the event the arbitrators be unable to select an umpire within fifteen (15) days after their appointemnt, Judge M. M. Allison is to select an umpire from three (3) names submitted by each respective side.

The operator and his superintendent and mine manager shall be respected in the management of the mine and in direction of the working force. All day men shall perform whatever kind of day labor the management may direct them to perform from time to time.

The right to hire includes the right to discharge, and it is not the purpose of this agreement to abridge the rights of the employer in either of these respects. If, however, any employe shall be suspended or discharged by the company, and it is claimed that an injustice has been done him, an investigation shall be conducted as herein provided, and if it is determined that an injustice has been done, the operator agrees to reinstate said employe.

GENERAL RULES.

1. Rooms must be driven up 150 feet, exclusive of necks (when practical to do so), and miner must work his place out before being entitled to another, unless the place becomes unsafe or impracticable to be worked (in opinion of mine foreman and the bank committee).

2. Timbers of proper sizes and length must be set in rooms by the miners not over three (3) feet apart vertically and horizontally, and closer when necessary; and suitable timbers must be set in all other places requiring same, by the miner who drives the place.

3. When quitting the employment of the company, the miner must properly timber up, brush roadway, lay track up to the face, and leave his place in shape so that it can be given away without expense of dead work, before he will get a settlement.

4. Nine (9) hours shall constitute a day's work (except in cases otherwise provided for) and this means at the face or working place of each individual employe, and is exclusive of the time required in reaching or leaving the same at the commencement or completion of the day.

5. Measurements will be made once a month and as near the last as is reasonably possible.

6. Pay-days will be on the first Saturday after the 20th, after work hours, for work done in the preceding month, and no cash will be paid out on written notices or otherwise except on regular pay-days, except at the option of the company .

7. House coal will be delivered to employes within radius of the camp at $1.75 per ton for M. R. coal, and outside of the camp at prices to be agreed upon according to distance of haul, and any one found taking coal from the company or employes will be charged an amount which, in the discretion of the company, may meet the gravity of the offense.

8. Any one taking tools, mine supplies or other property of an employe without his consent, or taking company tools or property from the department in which they belong, without first getting the consent of the employe in whose charge they are, will be rigidly dealt with, and unless offering the very best kind of an excuse will be discharged.

9. The following monthly stoppages will be made, for those living within the radius of the camp: Doctor—single men, 75c; heads of families, $1.25. Blacksmiths—for sharpening augers and picks, 35c. School—single men, 25c; those having children of school age, 50c.

10. Prices for rent, commissaries and mining supplies will remain unchanged, except as market conditions may warrant changes from time to time.

11. Hours for work shall be from 7 A.M. to 4 P.M. Shooting hour, 4 P.M. Entry men are to start firing and must shoot on time. They are also expected to report any on their road shooting out of order or at the proper time as provided for. Neither coal or slack are to be used for tamping. Open lights must be kept at a safe distance from powder, and miner must remove his lamp before making up shots. Powder kegs are not to be punched with picks or instruments of steel or iron, but the caps must be removed cautiously.

12. When a full day's work can not be had, the company will quarter out and pay day men for only the actual hours worked.

13. When the air of the mine has been made impure through the burning of kerosene oil, or from any other cause contrary to the mining law, or where the circuit has been impaired through obstructions placed in the airway, or the leaving open of doors, injury to stoppings, etc., a penalty will be applied when done through carelessness or negligence, and when done from maliciousness, the Mining Laws of the State will be invoked.

14. No one but those whose duties require it are to ride trips either upon the inside or outside of the mines, and all parties are warned to stay off haulways and incline while trips are moving.

15. Any one working for the company or upon their premises hereby accepts the Wage Scale and these Rules and Regulations as an agreement betweeen themselves and this company, and the same can be altered or amended as conditions may warrant.

Witness our hands this 30th day of November, 1910.

MONTLAKE COAL COMPANY,

BY CARL WHITE, *Pres.*

Approved: JONH F. BOWDEN, *Pres.* Dist. No. 19, U. M. W. of A.
PAT CARY, *Vice Pres.* Dist. No. 19, U. M. W. of A.

COAL MINES IN TENNESSEE

Section 9 of the Mining Code of Tennessee provides that "The maximum period that shall occur between inspections and examinations of each mine in this State, and the minimum quantity of fresh air that shall be supplied to each person and each animal employed in the mines of this State shall be governed by the following classification of mines, based upon the existing conditions heretofore, at present, or may appear in the future, in accordance with the conditions jeopardizing human life and health in such mines. The classification shall be as follows:

Class A shall include every coal mine or other mine known to liberate fire damp (CH_4) at present or in the future, and all mines of this class shall be inspected by the chief inspector, or the district inspector, at least once every sixty (60) days; and the minimum amount of fresh air supplied to each person and animal employed in the mine, by the ventilating currents, shall be one hundred and fifty (150) cubic feet per minute for each person, and six hundred (600) cubic feet per minute for each animal employed in the mine at one time. At any time fire damp is discovered in the mine or mines of other classes the inspector may place such mine or mines in this class, and then it shall be subject to the restrictions herein prescribed for the operation of mines of such class. However, if the amount of fire damp is slight or limited, and the safety of employes is not endangered from such gas, the chief inspector may use his best judgment in changing the classification of such mine or mines; and any mine liberating sufficient fire damp to be detected on the flame of a modern test lamp, may, by action of the chief mine inspector, be placed in this class; and if changes are necessary in order that they may comply with this act, the chief inspector shall allot them a reasonable time to make such changes; and if he deems it necessary, he may remove a portion of or all the inside employes until such changes are made in accordance with the provisions of this Act. The minimum amount of fresh air required and specified may be increased by the chief inspector should he deem it necessary for the better protection of human life and health, as the conditions may require.

Class B shall include every coal or other mine that is dry and dusty to such an extent as, in the best judgment of the chief inspector, renders the same dangerous from dust explosions; and where coal or other dust is deposited on timbers, sides and bottoms of the airways, entries or other workings of the mine, and where danger would be increased by too great a velocity of the ventilating currents in mines of this class, the minimum amount of fresh air supplied by ventilating currents shall not be less than one hundred (100) cubic feet per minute for each person, and five hundred (500) cubic feet per minute for each animal employed in the mine at one time; and the chief inspector or a district inspector shall inspect and examine each mine of this class at least once every sixty (60) days, or oftener, and determine if the mine is operated under the restrictions of this Act and those governing mines of this class. The chief mine inspector shall have the right to classify the mines and determine to what class they shall belong.

Class C shall include every coal or other mine employing over twenty (20) persons and three (3) mules that is not at present or may in the future liberate sufficient fire damp to be detected on the flame of a modern test lamp, and has

not been classed as a dry and dusty mine by the chief inspector of mines. The minimum quantity of fresh air that shall be supplied to each person employed in the mine by the ventilating currents shall be eighty-five (85) cubic feet per minute, and for each animal employed in the mine it shall be five hundred (500) cubic feet per minute; and it shall be the duty of the chief mine inspector or a district inspector to inspect and examine each mine of this class at least once every ninety (90) days; and at any time conditions may require, the chief inspector may increase the quantity of fresh air to be supplied by ventilating currents, and when conditions may require, may change mines from one class to another by proper notice to all parties interested.

Class D shall include all coal or other mines working less than twenty (20) persons in which fire damp has not been discovered at any time, and which are not considered to be dry and dusty mines. This class of mines shall supply the same amount of fresh air by ventilating currents to persons working in same as required for Class C mines. Mines of this class shall be inspected every ninety (90) days by the chief inspector or a district inspector. The chief inspector shall have the authority to change the classification of mines of this class as the conditions may require to maintain them in proper classes.

Class E shall include all copper, iron ore, phosphate, lead or other minerals being mined by shaft, slope, drift or otherwise; and mines of this class shall be examined once every three (3) months by the chief mine inspector or a district inspector, and the amount of fresh air supplied by the ventilating currents for each person and animal employed shall be governed by the conditions therein, and in no case shall the quantity of the ventilating currents be increased over that of "Class A" mines; provided, however, that whenever any explosive gases are met with, the chief inspector shall fix the required amount of ventilating current per person.

SPECIAL RULES.

Under and by virtue of the provisions of the Mining Laws, the Chief Mine Inspector,and the District Mine Inspectors, are required to formulate special rules in conjunction with the Superintendent and Mine Foreman, for the regulation and operation of dry and dusty or gaseous mines.

Under this provision of the Mining Law, the following mines are operated under special rules: Black Diamond 1, Black Diamond 5, Black Diamond 6, Cross Mountain 1, in Anderson County; Atpontley, 2 and 6, in Bledsoe County; Bear Wallow, Rex 1 and 2, Westbourne and Zechini, in Campbell County; Yellow Creek, 2, in Claiborne County; Fentress, 1, in Fentress County; Bowling, Brushy Mountain, 1, Brushy Mountain, 3, in Morgan County; Brier Hill, 1 and 2, and Overton, in Overton County; Fox, 1, 2 and 3, Prospect and Richland, in Rhea County; Old, in Roane County; Paint Rock, 1, and Stanley, in Scott County.

COAL MINING MACHINES.

In addition to the detail data given as to the various coal mines in Tennessee the following mines use under-cutting coal mining machines: Cross Mountain, Piedmont 2, Tennessee, Windrock, in Anderson County; Anchor, Bear Wallow, Cambria, Jackson, Elk Valley, Gem, Italy, Indian Mountain, Red Ash, Remy, Rex, 2, Rich Mountain, Westbourne, in Campbell County; Buffalo, Fork Ridge, Mingo, Sterling, in Claiborne County; Battle Creek in Marion County; Big Brushy, Bowling, Brushy Mountain 3, Little Brushy, in Morgan County; Phillips and West Hollow, in Scott County; and Bon Air Shaft, Bon Air 6, and Ravenscroft, in White County.

DETAIL COAL MINE DATA

The following chapter gives the description and detailed data pertaining to the various coal mines in Tennessee, as of December 31, 1910, arranged alphatbetically by counties and by mines, and limited to class and location of mines, seam worked, character of roof and bottom of seam, system of development, ventilation and haulage.

ANDERSON COUNTY.

Andys Ridge Mine—*Owner,* Coal Creek Mining & Mfg. Co., Knoxville; *Operator,* Briceville Coal Co., Briceville; *Superintenednt and Inside Foreman,* W. R. Keith, Briceville.

This is a Class C drift mine, located 1,000 feet above sea level, in Cumberland Mountain, 3 miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof is fire clay and the bottom slate. It is developed on the the single entry system. Ventilation is produced by natural conditions. Haulage is conducted from mine to tipple, a distance of 2,500 feet, by mules; and from tipple to railroad, a distance of 750 feet, by incline.

ANDERSON COUNTY.

Black Diamond No. 1 Mine—*Owner,* Coal Creek Mining & Mfg. Co., Knoxville; *Operator,* Black Diamond Coal Co., Knoxville; *President,* J. W. Borches, Knoxville; *Secretary,* Wm. F. Searle, Knoxville; *Superintendent,* L. F. Card, CoalCreek; *Inside Foreman,* W. E. Hendren; *Gas Boss,* Henry Hill, Coal Creek.

This is a Class B drift mine, located 1,024 feet above sea level, in Cumberland Mountain, 3 miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 44 inches, is worked. The roof is slate and the bottom fire clay and sandstone. It is developed on the double entry, room and pillar system. Ventilation is produced by fan with a diameter of 20 feet, and is distributed as continuous current. Haulage is conducted from rooms to rope siding, a distance of 8,000 feet, by electricity; and from rope siding to tipple, a distance of 4,700 feet, by tail rope.

ANDERSON COUNTY.

Black Diamond No. 5 Mine—*Owner,* Coal Creek Mining & Mfg. Co., Knoxville; *Operator,* Black Diamond Coal Co., Knoxville; *President,* J. W. Borches, Knoxville; *Secretary,* Wm. F. Searle, Knoxville; *Superintendent,* L. F. Card, Coal Creek; *Inside Foreman,* John Sharp, Coal Creek; *Gas Boss,* James Andrews, Coal Creek.

This is a Class A drift mine, located 1,029 feet above sea level, in Cumberland Mountain, 3 miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 44 inches, is worked. The roof is slate and the bottom fire clay and sandstone. It is developed on the double entry, room and pillar system. Ventilation is produced by fan with a diameter of 10 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 1,400 feet, by mules; and from sidetrack to tipple, a distance of 3,800 feet, by tail rope.

ANDERSON COUNTY.

Black Diamond No. 6 Mine—*Owner,* Coal Creek Mining & Mfg. Co., Knoxville; *Operator,* Black Diamond Coal Co., Knoxville; *President,* J. W. Borches, Knoxville; *Secretary,* Wm. F. Searle, Knoxville; *Superintendent and Inside Foreman,* John Jeffres, Sr., Briceville.

This is a Class B drift mine, located 1,000 feet above sea level, in Cumberland Mountain, 3½ miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof is fire clay and the bottom slate. It is developed on the room and pillar system. Ventilation is produced naturally and by furnace with a grate area of 40 feet. Work consists in removing outcrop coal in old Shamrock mine No. 1. Haulage is conducted from rooms to outside tram, a distance of 400 feet, by mules; and from outside tram to tipple, a distance of 3,085 feet, by mules.

ANDERSON COUNTY.

Brookside Mine—*Owner,* Coal Creek Mining & Mfg. Co., Knoxville; *Operator,* Minersville Coal Co., Pless; *President,* H. S. Pless, Pless; *Secretary,* E. G. Oats,

Knoxville; *Superintendent,* J. W. Goans, Pless; *Inside Foreman,* J. M. Stonecipher, Pless; *Gas Boss,* M. E. Duncan, Pless.

This is a Class A drift mine, located 1,000 feet above sea level, in Cumberland Mountain, ¼ mile from Pless, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom slate. It is developed on the double entry system. Ventilation is produced by fan with a diameter of 15 feet, and is distributed by the split system. Haulage is conducted from inside to outside, a distance of 1,000 feet, by mules; and from outside to tipple, a distance of 400 feet, by mules.

ANDERSON COUNTY.

Buck Mt. Mine—*Owner,* Coal Creek Mining & Mfg. Co., Knoxville; *Operator,* Minersville Coal Co., Pless; *President,* H. S. Pless, Pless; *Secretary,* E. G. Oats, Knoxville; *Superintendent,* J. W. Goans, Pless; *Inside Foreman,* J. M. Stonecipher, Pless; *Gas Boss,* M. E. Duncan, Pless.

This is a Class A drift mine, located 1,000 feet above sea level, in Cumberland Mountain, 1¼ miles, from Pless, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom slate. It is developed on the double entry system. Ventilation is produced by fan with a diameter of 10 feet, and is distributed by the split system. Haulage is conducted from headings to sidetrack, a distance of 1,000 feet, by mules; from sidetrack to outside, a distance of 2,000 feet, by rope; and from outside to tipple, a distance of 400 feet, by mules.

ANDERSON COUNTY.

Cross Mt. No. 1 Mine—*Owner,* Coal Creek Mining & Mfg. Co. Knoxville; *Operator,* Knoxville Iron Co., Knoxville; *President,* T. I. Stephenson, Knoxville, *Secretary,* O. A. Brown, Knoxville; *Superintendent,* P. F. Lynch, Briceville; *Inside Foreman,* Geo. Bulmer, Briceville; *Gas Boss,* J. F. Hatmaker, Briceville.

This is a Class B drift mine, located 1,006 feet above sea level, in Cumberland Mountain, 4 miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 46 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the entry and airway, double rooms and pillar system. Ventilation is produced by electric fan with 300 revolutions and a diameter of 7 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 2,200 feet, by mules; from sidetrack to outside, a distance of 6,600 feet, by electric motor.

ANDERSON COUNTY.

Cross Mt. No. 3 Mine—*Owner,* Coal Creek Mining & Mfg. Co., Knoxville; *Operator,* Knoxville Iron Co., Knoxville; *President,* T. I. Stephenson, Knoxville, *Secretary,* O. A. Brown, Knoxville; *Superintendent,* P. S. Lynch, Briceville; *Inside Foremen,* W. A. Farmer and D. J. Ridings, Briceville.

This is a Class C drift mine, located 1,006 feet above sea level, in Cumberland Mountain, 4 miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof is slate and fire clay and the bottom fire clay. It is developed on the entry and airway, single room and pillar system. Ventilation is produced by furnace with a grate area of 60 feet, and is distributed by the split system. Haulage is conducted from sidetrack to mine entrance, a distance of 1,000 feet, by mules; and from mine entrance to chute, a distance of 1,000 feet, by mules.

ANDERSON COUNTY.

Eureka Mine—*Owner,* Coal Creek Mining & Mfg. Co., Knoxville; *Operator,* Minersville Coal Co., Knoxville; *President,* H. S. Pless, Pless; *Superintendent,* J. W. Goans, Pless, *Inside Foreman,* J. M. Stonecipher, Pless; *Gas Boss,* M. E. Duncan, Pless.

This is a Class A drift mine, located 998 feet above sea level, in Cumberland Mountain, ¼ mile from Pless, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 42 inches, is worked. The roof and bottom are both slate. It is developed on the double entry, double room and pillar system. Ventilation is produced by fan with a diameter of 16 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 600 feet, by mules; from sidetrack to general sidetrack, a distance of 1,500 feet, by rope; and from general sidetrack to tipple, a distance of 650 feet, by mules.

ANDERSON COUNTY.

Fraterville Mine—*Owner,* Coal Creek Mining & Mfg. Co., Knoxville; *Operator,* Coal Creek Coal Co., Knoxville; *President,* E. C. Camp, Knoxville; *Secretary,* H. N. Camp, Knoxville; *Superintenednts,* G. M. Camp and W. H. Branscomb, Coal Creek; *Inside Foreman,* B. F. Loving, Coal Creek; *Gas Boss,* J. L. Jones, Coal Creek.

This is a Class B drift mine, located 985 feet above sea level, in Cumberland Mountain, 2 miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 42 inches is worked. The roof is slate and the bottom slate and fire clay. It is developed on the single entry system. Ventilation is produced by fan with a diameter of 16 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 4,000 feet, by mules; and from sidetrack to tipple, a distance of 7,000 feet, by tail rope.

ANDERSON COUNTY.

Middle Ridge Mine—*Owner,* Leath & Sawyer, Clinton; *Operator,* Tennessee Coal Co., Knoxville; *President,* Geo. P. Chandler, Knoxville; *Secretary,* Hugh L. McClung, Knoxville; *Superintendent,* E. F. Buffat, Briceville; *Inside Foreman,* Chas. Probert.

This is a Class C drift mine, located 975 feet above sea level, in Cumberland Mountain, 4 miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof is slate and clay and the bottom slate. It is developed on the entry and airway system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to drum, a distance, of 1,500 feet, by mules; and from drum to railroad, a distance of 716 feet, by incline.

ANDERSON COUNTY.

Piedmont No. 2 Mine—*Owner and Operator,* Coal Creek Mining & Mfg. Co., Knoxville; *President,* L. D. Tyson, Knoxville; *Superintendent,* W. H. Storrs, Knoxville; *Inside Foreman,* A. P. Cummings, Oliver Springs.

This is a Class B mine, located 1,100 feet above sea level, in Cumberland Mountain, 4 miles from Oliver Springs, and connects with L. & N. Railroad. The Coal Creek seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by fan with a diameter of 7 feet, and is distributed by the split system. Haulage is conducted from mine to mouth, a distance of 4,000 feet, by rope; and from mouth to tipple, a distance of 1,000 feet, by mules.

ANDERSON COUNTY.

Piedmont No. 4 Mine—*Owner and Operator,* Coal Creek Mining & Mfg. Co., Knoxville; *President,* L. D. Tyson, Knoxville; *Superintendent,* W. H. Storrs, Knoxville; *Inside Foreman,* A. P. Cummings, Oliver Springs; *Gas Boss,* C. A. Hall, Oliver Springs.

This is a Class B mine, located 1,100 feet above sea level in Cumberland Mountain, 4 miles from Oliver Springs, and connects with L. & N. Railroad. The Coal Creek seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by furnace with a grate area of 36 feet, and is distributed by the split system. Haulage is conducted from mine to knuckle, a distance of 4,000 feet, by mules; and from knuckle to tipple, a distance of 300 feet by gravity.

ANDERSON COUNTY.

Taft Mine—*Owner,* Coal Creek Mining & Mfg. Co., Knoxville, *Operators,* G. M. Camp and W. H. Branscom, Coal Creek; *President,* C. E. Camp, Knoxville; *Secretary,* H. N. Camp, Knoxville; *Superintendents,* G. M. Camp and W. H. Branscom, Coal Creek; *Inside Foreman,* Geo. Bennett, Coal Creek.

This is a Class C drift mine, located 990 feet above sea level, in Cumberland Mountain, 2½ miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 78 inches, is worked. The roof is slate and the bottom slate. It is developed on the single entry system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to tipple, a distance of 2,000 feet, by mules.

ANDERSON COUNTY.

Tennessee Mine—*Owner,* Coal Creek Mining & Mfg. Co., Knoxville; *Operator,* Tennessee Coal Co., Knoxville; *President,* Geo. P. Chandler, Knoxville; *Secretary,*

H. L. McClung, Knoxville; *Superintendent,* E. F. Buffatt, Briceville; *Inside Foremen,* H. H. Braden, C. B. Garden and J. C. White, Briceville.

This is a Class B drift mine, located 972 feet above sea level, in Cumberland Mountain, 4 miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof is slate and shale and the bottom slate. It is developed on the double entry, room and pillar system. Ventilation is produced by fan with a diameter of 16 feet, and is distributed by the split system. Haulage is conducted from rooms to parting, a distance of 2,000 feet, by mules; and from parting to tipple, a distance of 6,000 feet, by rope.

ANDERSON COUNTY.

Thistle Mine—*Owner,* Coal Creek Mining & Mfg. Co., Knoxville; *Operator,* Coal Creek Coal Co., Knoxville; *President,* E. C. Camp, Knoxville; *Secretary,* H. N. Camp, Knoxville; *Superintendents,* G. M. Camp and W. H. Branscom, Coal Creek; *Inside Foreman,* D. D. Hutson, Coal Creek; *Gas Boss,* H. V. Stone, Coal Creek.

This is a Class B drift mine, located 980 feet above sea level, in Cumberland Mountain, 3 miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 42 inches, is worked. The roof is slate and sandstone and the bottom slate and fire clay. It is developed on the single entry system. Ventilation is produced by fan with a diameter of 16 feet, and is distributed by the airway and split system. Haulage is conducted in No. 1, from headings and room to sidetrack, a distance of 3,000 feet, by mules; and from sidetrack to tipple, a distance of 1,800 feet, by mules; and in No. 2, from sidetrack to tipple, a distance of 3,000 feet, by mules.

ANDERSON COUNTY.

Wind Rock No. 1 Mine—*Owner,* Bessemer Coal, Iron & Land Co., Bessemer, Ala.; *Operator,* Wind Rock Coal & Coke Co., Wind Rock; *President,* H. L. Badham, Birmingham, Ala.; *Secretary,* R. E. Evans, Bessemer, Ala.; *Superintendent,* W. G. Srodes, Wind Rock; *Inside Foreman,* T. M. Doyle, Wind Rock.

This is a Class C mine, located 2,400 feet above sea level in Wind Rock Mountain, 3 miles from Oliver Springs, and connects with L. & N. Railroad. The Dean seam, having an average thickness of 57 inches, is worked. The roof is slate under sandstone and the bottom fire clay. It is developed on the panel system. Ventilation is produced by fan with a diameter of 6 feet, and is distributed by the split system. Haulage is conducted from butt entrys to haulway, a distance of 4,000 feet, by electric motors; from haulway to upper tipple, a distance of 4,000 feet, by electric motors; and from upper tipple to lower tipple, a distance of 4,400 feet, by gravity plane.

BLEDSOE COUNTY.

Atpontley No. 2 Mine—*Owner and Operator,* Atpontley Coal Co., Atpontley; *President,* John B. Atkinson, Earlington, Ky.; *Secretary,* Paul M. Moore, Earlington, Ky.; *Superintendent,* C. B. Finley, Atpontley; *Inside Foreman,* R. J. Hoge, Atpontley.

This is a Class C drift mine, located 1,500 feet above sea level, in Cumberland Mountain, 3 miles from Atpontley, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 34 inches, is worked. The roof is slate and sandstone and the bottom fire clay. It is developed on the single entry, room and pillar system: Ventilation is produced by fan with a diameter of 6 feet, and is distributed by the split system. Haulage is conducted from sidetrack to head of incline, a distance of 1,500 feet, by mules; and from head of incline to tipple, a distance of 4,200 feet, by gravity.

BLEDSOE COUNTY.

Atpontley No. 6 Mine—*Owner and Operator,* Atpontley, Coal Co., Atpontley; *President,* John B. Atkinson, Earlington, Ky.; *Secretary,* Paul M. Moore, Earlington, Ky.; *Superintendent,* C. B. Finley, Atpontley; *Inside Foreman,* R. J. Hoge, Atpontley.

This is a Class C drift mine, located 1,600 feet above sea level, in Cumberland Mountain, ¾ mile from Atpontley, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by fan with a diameter of 6 feet, and is distributed by the split system. Haulage is conducted from inner sidetrack to small incline, a distance of 1,000 feet, by mules; from head of small incline to head of main incline, a distance of 400 feet, by gravity; and from head of main incline to tipple, a distance of 4,200 feet, by gravity.

CAMPBELL COUNTY.

Anchor Mine—*Owner,* J. L. Hefferman, Morley; *Operator,* Anchor Coal Co., Knoxville; *President,* J. D. Racht, Knoxville; *Secretary and Superintendent,* H. W. Smith, Knoxville; *Inside Foreman,* J. D. Smith, Morley.

This is a Class C drift mine, located 1,400 feet above sea level, in White Oak Mountain, 1½ miles from Morley, and connects with L. & N. Railroad. The Davis Creek seam having an average thickness of 36½ inches, is worked. The roof is fire clay and the bottom hard fire clay. It is developed on the double entry system. Ventilation is produced by fan with a gasoline engine of 8 feet, and is distributed by the split system. Haulage is conducted from room to knuckle, a distance of 1,600 feet, by mules.

CAMPBELL COUNTY.

Baird B. G. Mine—*Owner and Operator,* Lewis Baird, Elk Valley; *Superintendent,* Lewis Baird, Elk Valley; *Inside Foreman,* Aaron Baird, Elk Valley.

This is a Class C drift mine, located 1,250 feet above sea level, in Jellico Mountain, 1¼ miles from Elk Valley, and connects with Southern Railroad. The Blue Gem seam, having an average thickness of 20 inches, is worked. The roof is slate and stone and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by furnace with a grate area of 6 feet. Haulage is conducted from entry to railroad, a distance of 500 feet, by mules.

CAMPBELL COUNTY.

Bear Wallow Mine—*Owner,* Bowling, Boyd & Carter, Knoxville; *Operator,* Bear Wallow Coal Co., Caryville; *President,* H. B. Bowling, Clinton; *Secretary,* J. L. Boyd, Knoxville; *Superintendent,* A. H. Bowling, Caryville; *Inside Foreman,* F. E. Allen, Caryville.

This is a Class A slope mine, located 1,050 feet above sea level, in Cumberland Mountain, ½ mile from Caryville, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 42 inches, is worked. The roof is slate and sandstone, and bottom slate. It is developed on the single entry system. Ventilation is produced by fan with a diameter of 6 feet, and is distributed as continuous current. Haulage is conducted from headings to bottom of slope, a distance of 2,000 feet, by mules; and from bottom of slope to tipple, a distance of 150 feet, by engine.

CAMPBELL COUNTY.

Big Block Mine—*Owner and Operator,* J. H. Wilson, Cupp; *Inside Foreman,* J. Z. Marshall, LaFollette.

This is a Class C drift mine, located 1,275 feet above sea level, in Cumberland Mountain, 1 mile from Cupp, and connects with L. & N. Railroad. The Jellico seam, having an average thickness of 34 inches, is worked. The roof is sandstone and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by fan with a diameter of 6 feet, and is distributed as continuous current. Haulage is conducted from rooms to sidetrack, a distance of 800 feet, by mule; and from sidetrack to tipple, a distance of 400 feet, by rope.

CAMPBELL COUNTY.

Block No. 2 Mine—*Owner and Operator,* Block Coal & Coke Co., Block; *President,* Robt. Wedekind, Louisville, Ky.; *Secretary,* W. G. Polk, Louisville, Ky.; *Superintendent,* John P. Gorman, Knoxville; *Inside Foreman,* M. K. Marlow, Block.

This is a Class C drift mine, located 2,600 feet above sea level, in Cross Mountain, one mile from Block, and connects with Southern Railroad. The Block seam, having an average thickness of 72 inches, is worked. The roof is slate and the bottom clay. It is developed on the double entry system. Ventilation is produced by fan with a diameter of 6 feet. Haulage is conducted from mine to drum, a distance of 600 feet, by motor; and from drum to tip house, a distance of 4,400 feet, by gravity.

CAMPBELL COUNTY.

Block No. 3 Mine—*Owner and Operator,* Block Coal & Coke Co., Block; *President,* Robt. Wedekind, Louisville, Ky.; *Secretary,* W. G. Polk, Louisville, Ky.; *Superintendent,* John P. Gorman, Knoxville; *Inside Foreman,* M. K. Marlow, Block.

This is a Class C drift mine, located 2,500 feet above sea level, in Cross Mountain, 1 mile from station, and connects with Southern Railroad. The Monarch seam, having an average thickness of 72 inches, is worked. The roof is slate and the bottom slate.

It is developed on the double entry system. Ventilation is produced by fan with a diameter of 5 feet, and is distributed by the split system. Haulage is conducted from inside to outside, a distance of 1,000 feet, by motor; from outside to knuckle, a distance of 1,450 feet, by motor; from knuckle to bottom of incline, a distance of 1,400 feet, by gravity; from bottom of incline to tipple, a distance of 1,750 feet, by motor; and from tipple to railroad, a distance of 2,440 feet, by gravity.

CAMPBELL COUNTY.

Blue Gem (Speed) Mine—*Owner and Operator,* Blue Gem Coal Co., Jellico; *President,* J. L. Moses, Louisville, Ky.; *Secretary,* L. Solomon, Louisville, Ky.; *Superintendent,* J. F. MacPherson, Jellico; *Inside Foreman,* James Haywood, Jellico.

This is a Class A drift mine, located 1,000 feet above sea level, in Pine Mountain, 1½ miles from Jellico, and connects with Southern Railroad. The Blue Gem seam, having an average thickness of 26 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace with a grate area of 30 feet. Haulage is conducted from rooms to knuckle, a distance of 1,100 feet, by mules; and from knuckle to incline, a distance of 200 feet, by mules.

CAMPBELL COUNTY.

Cambria Mine—*Owner,* Coal Creek Mining & Mfg. Co., Knoxville; *Operator,* Royal Coal & Coke Co., Coal Creek; *President,* H. S. Pless, Pless; *Secretary,* W. A. Pless, Coal Creek; *Superintendent,* Chas. E. Bell, Coal Creek; *Inside Foreman,* John Dixon, Coal Creek.

This is a Class A drift mine, located 1,136 feet above sea level, in Cumberland Mountain, 3 miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 40 inches, is worked. The roof is fire clay and slate and the bottom fire clay. It is developed on the double entry, room and pillar system. Ventilation is produced by fan, with a diameter of 20 feet, and is distributed by the split system. Haulage is conducted from rooms to side track, a distance of 2,500 feet, by mules; and from side track to chute, a distance of 4,200 feet, by rope.

CAMPBELL COUNTY.

Caryville Mine—*Owner,* East Tenn. Iron & Coal Co., Knoxville; *Operator,* Caryville Coal Co., Caryvile; *President,* Thos. H. Gill, Milwaukee, Wis.; *Secretary,* J. H. McManaman, Caryville; *Superintendent,* J. H. McManaman, Caryville; *Inside Foreman,* J. W. Duncan, Caryville.

This is a Class C drift mine, located 2,445 feet above sea level, in Cumberland Mountain, 2 miles from Caryville, and connects with Southern R. R. The Coal Creek seam, having an average thickness of 45 inches, is worked. The roof is blue slate and the bottom slate. It is developed on the room and pillar system. Ventilation is produced by fan, with a diameter of 8 feet, and is distributed as continuous current. Haulage is conducted from upper tipple to 8th left entry, a distance of 1,700 feet, by rope; from upper tipple to 3rd left entry, new side, a distance of 1,700 feet, by rope; and from 8th entry to heading, a distance of 2,000 feet, by mules.

CAMPBELL COUNTY.

Chaska No. 1 Mine—*Owner and Operator,* Chaska Coal Co., Knoxville; *President,* F. B. Cooley, Sr., Knoxville; *Secretary,* W. M. Sexton, Chaska; *Inside Foreman,* J. W. Payne, Chaska.

This is a Class C drift mine, located 1,500 feet above sea level, in White Oak Mountain, ½ mile from Chaska, and connects with L. & N. Railroad. The Rich Mountain seam, having an average thickness of 43 inches is worked. The roof is slate and the bottom fire clay. It is developed on the single entry and airway system. Ventilation is produced by furnace, with a grate area of 25 feet, and is distributed as continuous current. Haulage is conducted from rooms to sidetrack, a distance of 1,200 feet, by mules; and from sidetrack to drum, a distance of 2,150 feet, by mules. Length of incline, 750 feet.

CAMPBELL COUNTY.

Chaska No. 3 Mine—*Owner and Operator,* Chaska Coal Co., Knoxville; *President,* F. B. Cooley, Sr., Knoxville; *Secretary and Superintendent,* W. M. Sexton, Chaska; *Inside Foreman,* J. W. Payne, Chaska.

This is a Class C drift mine, located 1,400 feet above sea level, in spur of Rich Mountain, 1 mile from Chaska, and connects with L. & N. Railroad. The Rich Mountain

seam, having an average thickness of 40 inches, is worked. The roof is fire clay or soap stone and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by furnace, with a grate area of 25 feet, and is distributed as continuous current. Haulage is conducted from mines to tip house, a distance of 5,000 feet, by mules; from side track to first drum, a distance of 900 feet, by mules; from first drum to tram, a distance of 375 feet, by mules; from main tram to second drum, a distance of 2,700 feet, by mules; and from second drum to tip house, a distance of 750 feet, by mules.

CAMPBELL COUNTY.

Davis Crek No. 1 Mine—*Owner,* G. W. Parrott, Atlanta, Ga.; *Operator,* Davis Creek Coal Co., Cupp; *President,* G. W. Parrott, Atlanta, Ga.; *Secretary,* Ed Reilly, Atlanta, Ga.; *Superintendent,* I. Livingston, Cupp; *Inside Foreman,* John Facinola, Cupp.

This is a Class C drift mine, located 1,975 feet above sea level, in Cumberland Mountain, ½ mile from Cupp, and connects with the L. & N. Railroad. The Rich Mountain or Remy seam, having an average thickness of 34 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by furnace, with a grate area of 25 feet, and is distributed as continuous current. Haulage is conducted from rooms to knuckle 1, a distance of 1,000 feet, by mules; from knuckle 1 to bottom of incline, a distance of 750 feet, by rope; from bottom of incline to knuckle 2, a distance of 200 feet, by gravity; and from knuckle 2 to tipple, a distance of 100 feet, by rope.

CAMPBELL COUNTY.

Davis Creek No. 2 Mine—*Owner,* G. W. Parrott, Atlanta, Ga.; *Operator,* Davis Creek Coal Co., Cupp; *President,* G. W. Parrott, Atlanta, Ga.; *Secretary,* P. E. Huley, Atlanta, Ga.; *Superintendents,* Bert Facinoli and I. Livingston, Cupp; *Inside Foremen,* Charles Grimes and Sam Gray, Cupp.

This is a Class D drift mine, located 1,975 feet above sea level, in Cumberland Mountain, ½ mile from Cupp, and connects with L. & N. Railroad. The Rich Mountain or Remy seam, having an average thickness of 32 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by furnace, with a grate area of 25 feet, and is distributed as a continuous current. Haulage is conducted from rooms to knuckle 1, a distance of 1,000 feet, by mules; from knuckle 1 to bottom of incline, a distance of 800 feet, by gravity; and from knuckle 2 to chute, a distance of 100 feet, by gravity.

CAMPBELL COUNTY.

Elkhart Mine—*Owner and Operator,* Elkhart Blue Gem Coal Co., Bricevllle and Elk Valley; *President,* G. P. Norman, Briceville; *Secretary,* J. C. Wallace, Clinton; *Superintendent and Inside Foreman,* J. T. Baird, Elk Valley.

This is a Class D drift mine, located 2,100 feet above sea level, in Cumberland Mountain, ½ mile from Elk Valley, and connects with Southern Railroad. The Blue Gem seam, having an average thickness of 20 inches, is worked. The roof is sandstone and slate and the bottom rock. It is developed on the single entry system. Ventilation is produced by natural conditions. Haulage is conducted from main entry to chute outside, a distance of 1,000 feet, by mule; and from chute at mines to chute at railroad sidetrack, a distance of 1,500 feet, by mules.

CAMPBELL COUNTY.

Elk Valley Mine—*Owner,* Elk Valley Coal & Iron Co., Jacksboro; *Operator,* Elk Valley Jellico Coal Co., Elk Valley; *President,* J. M. Biber, Jacksboro; *Secretary,* W. L. Queener, Elk Valley; *Superintendent,* D. W. Parrott, Elk Valley; *Inside Foreman,* E. L. Robinson, Elk Valley.

This is a Class C drift mine, located 1,300 and 1,600 feet above sea level, in Jellico Mountain, 2 miles from Elk Valley, and connects with Southern Railroad. The Jellico and Splint seams, having an average thickness of 36 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the room and pillar system. Ventilation is produced by furnace with a grate area of 15 feet, and is distributed by air ways. Haulage is conducted from rooms 1 to outside, a distance of —— feet, by mules; from Splint vein to tipple, a distance of 8,000 feet, by locomotive; and from Jellico vein to tipple, a distance of 8,000 feet, by locomotive.

CAMPBELL COUNTY.

Evans Mine—*Owner and Operator,* Evans Coal Co., Jellico; *President,* P. F. Gor-

man, Jr., Jellico; *Secretary,* J. L. Slusher, Anthras; *Superintendent and Inside Foreman,* P. F. Gorman, Jellico.

This is a Class C drift mine, located 1,200 feet above sea level, in Pine Mountain, 2 miles from Jellico, and connects with Southern Railroad. The Blue Gem seam, having an average thickness of 24 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace with a grate area of 4 feet. Haulage is conducted from rooms to sidetrack, a distance of 500 feet, by mules; from sidetrack to knuckle, a distance of 300 feet, by mules; and from knuckle to railroad, a distance of 500 feet, by incline.

CAMPBELL COUNTY.

Falls Branch Mine—*Owner and Operator,* Falls Branch Coal Co., Wooldridge; *President,* P. Wooldridge, Louisville, Ky.; *Superintendent,* William Dinkelaker, Wooldridge; *Inside Foreman,* J. W. Howe, Wooldridge.

This is a Class C drift mine, located 1,250 feet above sea level, in Jellico Mountain, 2 miles from Wooldridge, and connects with Southern Railroad. The Jellico seam, having an average thickness of 40 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single and double entry system. Ventilation is produced by fan with a diameter of 8 feet, and is distributed by the split system. Haulage is conducted from rooms to No. 2 sidetrack, a distance of 2,000 feet, by mules; from No. 2 sidetrack to outside track, distance of 2,500 feet, by engine; and from outside track to knuckle, distance of 5,200 feet, by locomotive

CAMPBELL COUNTY.

Gem Mine—*Owner and Operator,* LaFollette Coal, Iron and Ralroad Co., LaFollette; *President,* H. M. LaFollette, LaFollette; *Secretary,* J. H. Creekmore, LaFollette; *Superintendent,* James Wynn, Peabody; *Inside Foreman,* George Rigby, Peabody.

This is a Class C drift mine, located 1,998 feet above sea level, in Rock Creek Mountain, ¾ mile from Peabody, and connects with L. & N. Railroad. The Jordan seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar (air way following) system. Ventilation is produced by fan and furnace, with a 6-foot diameter fan and 30-foot furnace, and is distributed as continuous current. Haulage is conducted from rooms on butt entries to drift mouth, a distance of 3,500 feet, by motors; and from top to bottom of incline, a disance of 3,850 feet, by endless rope.

CAMPBELL COUNTY.

Indian Mountain No. 1 Mine—*Owner,* East Tennessee Coal Co., Jellico; *Operator,* The Proctor Coal Co., Red Ash, Ky.; *President,* Charles Finley, Williamsburg, Ky.; *Secretary,* F. W. Finley, Williamsburg, Ky.; *Superintendent,* Phil Francis, Jellico; *Inside Foreman,* J. P. Alred, Red Ash, Ky.

This is a Class B drift mine, located 1,300 feet above sea level, in Indian Mountain, 1 mile from Jellico, and connects with Southern and L. & N. Railroads. The Jellico seam, having an average thickness of 40 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by fan with a diameter of 11 feet, and is distributed by the split system. Haulage is conducted from rooms to entry, a distance of 200 feet, by miners; from entry to drum house, a distance of 3,900 feet by motors; from drum house to tip, a distance of 700 feet, by incline; and from tip to cars, a distance of 50 feet, by chute.

CAMPBELL COUNTY.

Indian Mountain No. 2 Mine—*Owner,* East Tennessee Coal Co., Jellico; *Operator,* The Proctor Coal Co., Red Ash, Ky.; *President,* Charles Finley, Williamsburg, Ky.; *Secretary,* F. W. Finley, Williamsburg, Ky.; *Superintendent,* Phil Francis, Jellico; *Inside Foreman,* J. P. Alred, Red Ash, Ky.

This is a Class B drift mine, located 1,300 feet above sea level, in Indian Mountain, 1 mile from Jellico, and connects with Southern and L. & N. Railroads. The Jellico seam, having an average thickness of 40 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by fan with a diameter of 11 feet, and is distributed by the split system. Haulage is conducted from rooms to entry, a distance of 200 feet, by miners; from entry to drum house, a distance of 2.500 feet by motors; from drum house to tip, a distance of 700 feet, by incline; and from tip to cars, a distance of 50 feet, by chute.

CAMPBELL COUNTY.

Italian B. G. Mine—*Owner,* Italian Blue Gem Coal Co., Jellico; *Operator,* Zechini Coal Co., Newcomb; *President,* Peter Zechini, Newcomb; *Secretary,* W. H. Jenkins, Newcomb; *Superintendent,* Thomas Zechini, Newcomb; *Inside Foreman,* W. A. Braden, Newcomb.

This is a Class B drift mine, located 1,200 feet above sea level, in Pine Mountain, 2 miles from Newcomb, and connects with Southern Railroad. The Blue Gem seam, having an average thickness of 22 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the single entry, double and single room system. Ventilation is produced by fan with a diameter of 4 feet, and is distributed by the split system. Haulage is conducted from rooms to drum, a distance of 3,800 feet, by mules; and from drum to chute at railroad, a distance of 1,150 feet, by gravity.

CAMPBELL COUNTY.

Italy Mine—*Owner and Operator,* Italy Coal Co., Jellico; *President,* R. B. Baird, Jellico; *Secretary,* C. O. Baird, Jellico; *Superintendent,* Thomas Zechini, Newcomb; *Inside Foreman,* Frank Matti, Cupp.

This is a Class C drift mine, located 1,275 feet above sea level, in Rich Mountain, ½ mile from Cupp, and connects with L. & N. Railroad. The Jellico seam, having an average thickness of 28 inches is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by a fan with a diameter of 4 feet, and is distributed by airways and break throughs. Haulage is conducted from rooms to sidetrack, a distance of 700 feet, by mules; and from sidetrack to tipple, a distance of 700 feet, by mules.

CAMPBELL COUNTY.

Jackson Mine—*Owner and Operator,* Campbell Coal Mining Co., Westbourne; *President,* R. O. Campbell, Atlanta, Ga.; *Secretary,* C. E. Pollard, Atlanta, Ga.; *Superintendent,* W. H. Sienknecht, Westbourne; *Inside Foreman,* W. H. Renwick, Westbourne.

This is a Class C drift mine, located 1,400 feet above sea level, in Log Mountain, ¼ mile from Westbourne, and connects with L. & N. Railroad. The Log Mountain seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom fire clay and rock. It is developed on the room and pillar system. Ventilation is produced by fan with a diameter of 7 feet, and is distributed as continuous current. Haulage is conducted from rooms to sidetrack, a distance of 1,200 feet, by mules; from sidetrack to tipple, a distance of 1,210 feet, by mules; and from tipple to railroad, a distance of 1,232 feet, by gravity.

CAMPBELL COUNTY.

Jellico B. G. Mine—*Owner,* E. Jameson Jones, Jellico; *Operator,* Jellico B. G. Coal Co., Jellico; *President and Secretary,* J. S. Jones, Jellico; *Superintendent and Inside Foreman,* H. M. Jones, Jellico.

This is a Class B drift mine, located 1,200 feet above sea level, in Pine Mountain, 1½ miles from Jellico, and connects with Southern Railroad. The Blue Gem seam, having an average thickness of 24 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the double entry system. Ventilation is produced by furnace with a grate area of 36 feet, and is distributed by cross cuts. Haulage is conducted from headings to outside, a distance of 1,200 feet, by mules; from outside to knuckle, a distance of 3,000 feet by mules; and from knuckle to tipple, a distance of 1,400 feet, by incline.

CAMPBELL COUNTY.

Jellico Cannel Mine—*Owner and Operator,* Jellico Cannel Company, Newcomb; *President,* Thomas N. Mordue, Chicago, Ill.; *Secretary,* H. L. Smith, Newcomb; *Superintendent,* Thomas Zechini, Newcomb; *Inside Foreman,* J. F. Russell, Newcomb.

This is a Class C mine, located 1,800 feet above sea level, in Main Jellico Mountain, 2 miles from Newcomb, and connects with Southern Railroad. The Jellico seam, having an average thickness of 36 inches, is worked. The roof is blue shale and slate, and the bottom fire clay. It is developed on the pillar and stump system. Haulage is conducted from rooms to entrance, a distance of 1,000 feet, by mules; from mouth of mine to top of first incline, a distance of 3,000 feet, by mules; and from bottom of first incline to top of second incline, a distance of 5,000 feet, by locomotive, steam.

CAMPBELL COUNTY.

Kimberly Mine—*Owner and Operator,* Kimberly Mining & Mfg. Co., Knoxville; *President,* J. K. Griffin, Knoxville; *Secretary,* B. A. Martin, Knoxville; *Superintendent,* F. D. French, Cupp; *Inside Foreman,* B. F. Smith, Cupp.

This is a Class C drift mine, located 1,555 feet above sea level, in Cumberland Mountain, 1 mile from Cupp, and connects with L. & N. Railroad. The Rich Mountain seam, having an average thickness of 38 inches, is worked. The roof is slate and sandstone and the bottom sandstone. It is developed on the single entry system. Ventilation is produced by fan with a diameter of 8 feet, and is distributed by the multiple system. Haulage is conducted from left headings to sidetrack, a distance of 800 feet, by mules; from siding to knuckle, a distance of 4,000 feet, by motors; from main heading to knuckle, a distance of 4,750 feet, by motors; from other headings to knuckle, a distance of 4,700 feet, by motors; and from knuckle to tip house, a distance of 700 feet, by gravity incline.

CAMPBELL COUNTY.

Marion-Anna Mine—*Owner and Operator,* Woolridge Jellico Coal Co., Woolridge; *President,* P. Woolridge, Pewee Valley, Ky.; *Secretary,* J. B. Brickey, Woolridge; *Superintendent,* William Dinkelaker, Woolridge; *Inside Foreman,* Thomas H. Griffith, Woolridge.

This is a Class C drift mine, located 1,225 feet above sea level, in Jellico Mountain. 1⅞ miles from Woolridge, and connects with Southern Railroad. The Jellico seam, having an average thickness of 36 inches is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by fan with a diameter of 8 feet, and is distributed as continuous current. Haulage is conducted form rooms to sidetrack, a distance of 1,500 feet, by mules; from sidetrack to general sidetrack, a distance of 2,000 feet, by motors; from general sidetrack to knuckle, a distance of 2,200 feet, by mules; from knuckle to tipple, a distance of 316 feet, by gravity; and from tipple to railroad, a distance of 224 feet, by gravity.

CAMPBELL COUNTY.

Morley Mine—*Owner and Operator,* Morley Coal Co., Knoxville; *President,* W. F. Park, Knoxville; *Secretary,* J. M. Hartman, Knoxville; *Superintendent,* J. C. Kranz, Knoxville; *Inside Foreman,* George Easler, Morley.

This is a Class C drift mine, located 1,300 feet above sea level, in Cumberland Mountain, 3½ miles from Jellico, and connects with L. & N. Railroad. The Kramor seam, having an average thickness of 34 inches, is worked. The roof is slate and the bottom clay. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace with a grate area of 32 feet, and is distributed as continuous current. Haulage is conducted from rooms to entrance, a distance of 600 feet, by mules; and from entrance to tipple, a distance of 800 feet, by incline.

CAMPBELL COUNTY.

Newman Mine—*Owner, Operator and Superintendent,* A. T. Newman, Jellico.

This is a Class D drift mine, located 1,200 feet above sea level, in Jellico Mountain, 1 mile from Jellico, and connects with Southern and L. & N. Railroads. The Blue Gem seam, having an average thickness of 28 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by furnace with a grate area of 24 feet. Haulage is conducted from rooms to mine entrance, a distance of 100 feet, by mules.

CAMPBELL COUNTY.

Powhatan Mine—*Owner and Operator,* Falls Branch Coal Co., Woolridge; *President,* P. Woolridge, Louisville, Ky.; *Superintendent,* William Dinkelaker, Woolridge; *Inside Foreman,* J. W. Howe, Woolridge.

This is a Class C drift mine, located 1,160 feet above sea level, in Jellico Mountain, 1½ miles from Woolridge, and connects with Southern Railroad. The Blue Gem seam, having an average thickness of 24 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to knuckle, a distance of 3,000 feet, by mules.

CAMPBELL COUNTY.

Red Ash Mine—*Owner,* East Tennessee Iron & Coal Co., Knoxville; *Operator,* Red Ash Coal Co., Caryville; *President,* G. M. Moore, Caryville; *Secretary,* G. B. Gallagher, Caryville; *Superintendent,* T. D. Richards, Caryville; *Inside Foreman,* C. L. Walls and D. W. Steadman, Caryville.

This is a Class C drift mine, located 2,450 feet above sea level, in Cumberland Mountain, 1 mile from Caryville, and connects with Southern Railroad. The Red Ash seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the double entry system. Ventilation is produced by fan with a diameter of 4 feet, and is distributed as continuous current. Haulage is conducted from face of entry to sidetrack, a distance of 2,000 feet, by electric locomotive; from sidetrack to tipple, a distance of 1,800 feet, by electric locomotive, where the coal is tipped into 10-ton monitor cars and conveyed to chute at railroad, a distance of 6,200 feet, over two sections of incline. The first section is operated by gravity, but the second by an engine plane. Distance to tipple from No. 2 main entry is 2,600 feet.

CAMPBELL COUNTY.

Remy Mine—*Owner and Operator,* Remy Coal Co., Gatliff; *President,* J. D. Wheeler, Gatliff; *Secretary,* W. B. Siler, Jellico; *Superintendent,* J. D. Wheeler, Gatliff; *Inside Foreman,* A. S. Lindsay, Gatliff.

This is a Class B drift mine, located 1,578 feet above sea level, in Log Mountain, ½ mile from Gatliff, and connects with L. & N. Railroad. The Rich Mountain seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom slate. It is developed on the single and double entry system. Ventilation is produced by fan with a diameter of 4 feet, and is distributed by airways and break throughs. Haulage is conducted from sidetrack No. 2 to sidetrack No. 1, a distance of 700 feet, by mules; from sidetrack No. 1 to knuckle, a distance of 1,000 feet, by mules; and from knuckle to tipple, a distance of 1,100 feet, by incline.

CAMPBELL COUNTY.

Rex No. 1 Mine—*Owner and Operator,* LaFollette Coal, Iron & Ry. Co., LaFollette; *President,* H. M. LaFollette, LaFollette; *Superintendent,* H. Bevin, LaFollette; *Inside Foreman,* J. D. Cramer, LaFollette; *Gas Boss,* David Ward, LaFollette.

This is a Class A slope mine, located 1,000 feet above sea level, in Cumberland Mountain, 1 mile from LaFollette, and connects with L. & N. and Southern Railroads. The Rex seam, having an average thickness of 44 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry, room and pillar system. Ventilation is produced by two fans with diameters of 8 and 13 feet, and is distributed as continuous current with splits. Haulage is conducted from rooms in cross entries to main entry, a distance of 1,500 feet, by mules; from main entry to foot of slope, a distance of 1,800 feet, by mules; and from foot of slope to tipple, a distance of 1,950 feet, by rope.

CAMPBELL COUNTY.

Rex No. 2 Mine—*Owner and Operator,* LaFollette Coal, Iron & Ry. Co., LaFollette; *President,* H. M. LaFollette, LaFollette; *Secretary,* J. H. Creekmore, LaFollette; *Superintendent,* Charles Hoebel, LaFollette, *Inside Foreman,* J. H. Marshall, LaFollette.

This is a Class A slope mine, located 1,000 feet above sea level, in Cumberland Mountain, 1 mile from LaFollette, and connects with L. & N. and Southern Railroads. The Rex seam, having an average thickness of 44 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry, room and pillar system. Ventilation is produced by two fans with diameters of 8 and 13 feet, and is distributed as continuous current with splits. Haulage is conducted from room in cross entries to main entry, a distance of 1,600 feet, by mules; from main entry to foot of slope, a distance of 2,000 feet, by mules; and from foot of slope to tipple, a distance of 1,000 feet, by rope.

CAMPBELL COUNTY.

Rich Mountain No. 1 Mine—*Owner and Operator,* Rich Mountain Coal & Coke Co., Bennett; *President,* H. W. Tillery, Bennett; *Secretary,* J. G. Howell, Knoxville; *Superintendent,* H. W. Tillery, Bennett; *Inside Foreman,* G. B. Keys, Bennett.

This is a Class C drift mine, located 1,270 feet above sea level, in Rich Mountain, 1 mile from Cupp, and connects with L. & N. Railroad. The Rich Mountain seam,

having an average thickness of 32 inches, is worked. The roof is slate and the bottom slate and fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by fan with a diameter of 12 feet, and is distributed as continuous current. Haulage is conducted from rooms to sidetrack, a distance of 1,200 feet, by mule; from sidetrack to tipple, a distance of 700 feet, by rope; and from tipple to chute, a distance of 4,200 feet, by incline.

CAMPBELL COUNTY.

Rock Spring Mine—*Owner,* East Tennessee Iron & Coal Co., Knoxville; *Operator,* Rock Spring Coal Co., Turley; *President,* Richard E. Miller, Atlanta, Ga.; *Secretary,* James J. Reiley, Knoxville; *Superintendent and Inside Foreman,* G. W. Card, Coal Creek.

This is a Class D drift mine, located 2,200 feet above sea level, in Cumberland Mountain, 1½ miles from Turley, and connects with Southern Railroad. The Dean seam, having an average thickness of 60 inches, is worked. The roof is blue slate and the bottom blue slate. It is developed on the double entry, room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to entrance, a distance of —— feet, by mules.

CAMPBELL COUNTY.

Southern No. 1 Mine—*Owner and Operator,* Southern Coal & Coke Co., Gatliff; *President,* Dr. A. Gatliff, Williamsburg, Ky.; *Secretary,* E. C. Mahan, Knoxville; *Superintendent,* J. C. Babb, Gatliff; *Inside Foremen,* J. C. Babb and William Pickle, Gatliff.

This is a Class C drift mine, located 1,800 feet above sea level, in Brushy Mountain, ½ mile from Gatliff, and connects with L. & N. Railroad. The Jordan seam, having an average thickness of 54 inches, is worked. The roof is sandstone and shale and the bottom fire clay and shale. It is developed on the single entry and airway system. Ventilation is produced by furnace, with a grate area of 48 feet, and is distributed as direct current. Haulage is conducted from rooms to sidetrack, a distance of 1,500 feet, by mules; from sidetrack to knuckle, a distance of 1,700 feet, by mules; and from knuckle to tiphouse, a distance of 1,800 fet, by incline.

CAMPBELL COUNTY.

Southern No. 2 Mine—*Owner and Operator,* Southern Coal & Coke Co., Gatliff; *President,* Dr. A. Gatliff, Williamsburg, Ky.; *Secretary,* E. C. Mahan, Knoxville; *Superintendent,* J. C. Babb, Gatliff; *Inside Foremen,* J. C. Babb and William Pickle, Gatliff.

This is a Class C drift mine, located 1,800 feet above sea level, in Brushy Mountain, ½ mile from Gatliff, and connects with L. & N. Railroad. The Jordan seam, having an average thickness of 54 inches, is worked. The roof is sandstone and shale and the bottom fire clay and shale. It is developed on the single entry and airway system. Ventilation is produced by furnace, with a grate area of 48 feet, and is distributed as direct current. Haulage is conducted from rooms to sidetrack, a distance of 1,800 feet, by mules; from sidetrack to general sidetrack, a distance of 940 feet, by mules; from general sidetrack to knuckle, a distance of 1,490 feet, by mules; and from knuckle to tipple, a distance of 1,800 feet, by incline.

CAMPBELL COUNTY.

Sun Mine—*Owner,* Lindsay Land Co., Knoxville; *Operator,* Sun Coal Co., Caryville; *President,* J. H. Bowling, Caryville; *Secretary,* M. A. Jacobs, Beaver Dam, Miss.; *Superintendent,* J. H. Bowling, Caryville; *Inside Foreman,* Warren Card, Caryville.

This is a Class C drift mine, located 2,425 feet above sea level, in Cumberland Mountain, 1 mile from Caryville, and connects with Southern Railroad. The Block seam, having an average thickness of 42 inches, is worked. The roof is slate and shale and the bottom shale. It is developed on the double entry, room and pillar system. Ventilation is produced by fan, with a diameter of 7 feet, and is distributed by the return airway system. Haulage is conducted from rooms to sidetrack, a distance of 1,000 feet, by mules; from sidetrack to tipple, a distance of 2,000 feet, by rope; and from tipple to railroad cars, a distance of 4,000 feet, by 12-ton monitors.

CAMPBELL COUNTY.

Tennessee-Jellico Mine—*Owner and Operator,* Tennessee-Jellico Coal Company,

Anthras; *President,* Robt. Wedekind, Louisville, Ky.; *Secretary,* W. G. Polk, Knoxville; *Superintendent,* John P. Gorman, Knoxville; *Inside Foreman,* Wm. Comer, Anthras.

This is a Class C drift mine, located 1,400 feet above sea level, in Cumberland Mountain, ½ mile from Anthras, and connects with L. & N. and Southern Railroads. The Jellico seam, having an average thickness of 52 inches, is worked. The roof is slate and the bottom stone. It is developed on the double entry, room and pillar system. Ventilation is produced by furnace, with a grate area of 72 feet, and is distributed as continuous current. Haulage is conducted from mines to drum, a distance of 2,000 feet, by engine; from rooms to mine entrance, a distance of 1,000 feet, by mules; and from mine entrance to tipple, a distance of 2,000 feet, by engine.

CAMPBELL COUNTY.

Westbourne, No. 1-2 Mine—*Owner and Operator,* Westbourne Coal Company, Westbourne; *President,* R. O. Campbell, Atlanta, Ga.; *Superintendent,* W. H. Sienknecht, Westbourne; *Inside Foreman,* J. H. Williams, Westbourne.

This is a Class C drift mine, located 1,100 feet above sea level, in Rich Mountain, at Westbourne, and connects with L. & N. Railroad. The Westbourne seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom fire clay and sandstone. It is developed on the single entry, room and pillar system. Ventilation is produced by electric fan, with a diameter of 12 feet, and is distributed by the split system. Haulage is conducted from all entries to knuckle, a distance of 3,000 feet, by motor; and from knuckle to railroad, a distance of 800 feet, by gravity.

CAMPBELL COUNTY.

Westbourne No. 3 Mine—*Owner and Operator,* Westbourne Coal Co., Westbourne; *President,* R. O. Campbell, Atlanta, Ga.; *Superintendent,* W. H. Sienknecht, Westbourne; *Inside Foreman,* J. H. Williams, Westbourne.

This is a Class C drift mine, located 1,100 feet above sea level, in Rich Mountain, at Westbourne, and connects with L. & N. and Southern Railroads. The Westbourne seam, having an average thickness of 48 inches, is worked. The roof is sandstone and the bottom fire clay. It is developed on the single room system. Ventilation is produced by furnace, with a grate area of 20 feet, and is distributed by the split system. Haulage is conducted from face of entry to knuckle, a distance of 700 feet, by motors; and from knuckle to railroad, a distance of 800 feet, by gravity incline.

CAMPBELL COUNTY.

Whistle Creek Mine—*Owner and Operator,* Whistle Creek Jellico Coal Co., Newcomb; *President,* C. M. Thomas, Paris, Ky.; *Secretary,* J. T. Bradley, Trosper, Ky.; *Superintendent,* Alex Ross, Trosper, Ky.

This is a Class D drift mine, located 1,300 feet above sea level, in Jellico Mountain, 2 miles from Newcomb, and connects with Southern R. R. The Jellico seam, having an average thickness of 36 inches, is worked. The roof is sandstone and the bottom slate. It is developed on the room and pillar system. Ventilation is produced by furnace, with a grate area of 25 feet, and is distributed as continuous current. Haulage is conducted from heading to knuckle, a distance of 400 feet, by mules.

CAMPBELL COUNTY.

Woodward Mine—*Owner, Operator, Superintendent and Inside Foreman,* C. M. Woodward, Jellico.

This is a Class C drift mine, located 1,200 feet above sea level, in Jellico Mountain, ½ mile from Jellico, and connects with L. & N. and Southern Railroads. The Blue Gem seam, having an average thickness of 24 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace, with a grate area of 35 feet, and is distributed by the split system. Haulage is conducted from headings to tipple, a distance of 1,000 feet, by mules.

CAMPBELL COUNTY.

Wooldridge Mine—*Owner and Operator,* Wooldridge Jellico Coal Co., Wooldridge; *President,* P. Wooldridge, Pewee Valley, Ky.; *Superintendent,* Wm. Dinkelaker, Wooldridge; *Inside Foreman,* Thos. H. Griffith, Wooldridge.

This is a Class C drift mine, located 1,200 feet above sea level, in Jellico Mountain, ½ mile from Wooldridge, and connects with Southern Railroad. The Jellico seam, having an average thickness of 38 inches, is worked. The roof is slate and the bottom

fire clay. It is developed on the single entry system. Ventilation is produced by fan, with a diameter of 8 feet, and is distributed as direct current. Haulage is conducted from rooms to knuckle, a distance of 900 feet, by mules; and from knuckle to railroad, a distance of 1,335 feet, by incline.

CAMPBELL COUNTY.

Wynn Mine—*Owner and Operator,* Wynn Coal Co., Gatliff; *President,* A. J. Jones, Gatliff; *Secretary,* J. H. Tinsley, Gatliff; *Superintendent,* Harry Wynn, Gatliff; *Inside Foreman,* W. H. Myers, Gatliff.

This is a Class C mine, located 1,200 feet above sea level, in Brush Mountain, and connects with L. & N. Railroad. The Rich Mountain seam, having an average thickness of 32 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the room and pillar system. Ventilation is produced by fan, with a diameter of 5 feet, and is distributed as continuous current. Haulage is conducted from mouth of rooms to top of incline, a distance of 1,200 feet, by mules; and from top of incline to railroad cars, a distance of 400 feet, by monitor.

CAMPBELL COUNTY.

Zechini Mine—*Owner and Operator,* Zechini Coal Co., Jellico; *President,* Peter Zechini, Newcomb; *Secretary,* W. H. Jenkins, Newcomb; *Superintendent,* Thos. Zechini, Newcomb; *Inside Foreman,* Joe Graef, Newcomb.

This is a Class B drift mine, located 1,275 fet above sea level, in Nigrous Mountain, 2 miles from Newcomb, and connects with Southern Railroad. The Jellico seam, having an average thickness of 34 inches, is worked. The roof is slate, sandstone and fire clay and the bottom fire clay. It is developed on the single and double room system. Ventilation is produced by fan, with a diameter of 6 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 653 feet, by mules; and from sidetrack to railroad, a distance of 3,000 feet, by mules. Length of incline, 1,000 feet.

CLAIBORNE COUNTY.

Bryson Mountain No. 1 Mine—*Owner,* The American Association, Inc., Middlesboro, Ky.; *Operator,* Bryson Mountain Coal & Coke Co., Hartranft; *President,* Timothy Cockill, Mahoney City, Penn.; *Superintendent,* A. L. Adam, Hartranft; *Inside Foreman,* Dan Gallagher, Hartranft.

This is a Class C drift mine, located 1,755 feet above sea level, in Bryson Mountain, 1 mile from Hartranft, and connects with L. & N. and Southern Railroads. The Bryson Mt. seam, having an average thickness of 60 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the double entry system. Ventilation is produced by fan, with a diameter of 8 feet, and is distributed as continuous current. Haulage is conducted from rooms to sidetrack, a distance of 800 feet, by mules; and from sidetrack to tipple, a distance of 6,000 feet, by motors.

CLAIBORNE COUNTY.

Bryson Mountain No. 2 Mine—*Owner,* The American Association, Inc., Middlesboro, Ky.; *Operator,* Bryson Mountain Coal & Coke Co., Hartranft; *President,* Timothy Cockill, Mahoney City, Penn.; *Superintendent,* A. L. Adam, Hartranft; *Inside Foreman,* Dan Gallagher, Hartranft.

This is a Class C drift mine, located 2,255 fet above sea level, in Bryson Mountain, 1 mile from Hartranft, and connects with L. & N. and Southern Railroads. The Bryson Mt. No. 2 seam, having an average thickness of 72 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the double entry system. Ventilation is produced by fan, with a diameter of 8 feet, and is distributed as continuous current. Haulage is conducted from entries to tipple, a distance of 1,500 feet, by mules; and from tipple to railroad, a distance of 800 feet, by rope.

CLAIBORNE COUNTY.

Buffalo Mine—*Owner and Operator,* Campbell Coal Mining Co., Eagan; *President,* R. O. Campbell, Atlanta, Ga.; *Secretary,* John J. Eagan, Atlanta, Ga.; *Inside Foreman,* J. B. Cunningham, Eagan.

This is a Class C drift mine, located 1,425 feet above sea level, in Cumberland Mountain, at Eagan, and connects with L. & N. and Southern Railroads. The Remy seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the room and pillar system. Ventilation is produced by 4 furnaces, with a grate area of 50 feet each, and by 2 electric fans, with a diameter of

4 feet, and is distributed as continuous current. Haulage is conducted from face to drum house, a distance of 4,000 feet, by motors; and from drum house to tipple, a distance of 667 feet, by gravity.

CLAIBORNE COUNTY.

Fork Ridge No. 1 Mine—*Owner* American Association (Incorporated), Middlesboro, Ky.;*Operator,* Fork Ridge Coal & Coke Co., Fork Ridge; *President,* C. S. McManus, Knoxville; *Secretary,* B. T. Milam, Middlesboro, Ky.; *Superintendent,* A. H. Rennebaum, Middlesboro, Ky.; *Inside Foreman,* John Lewis, Fork Ridge.

This is a Class C drift mine, located 1,700 feet above sea level, in Mingo Mountain, ¼ mile from Fork Ridge, and connects with L. & N. and Southern Railroads. The Mingo seam, having an average thickness of 52 inches, is worked. The roof is slate and the bottom clay. It is developed on the double entry system. Ventilation is priduced by fan with a diameter of 14 feet, and is distributed by the split system. Haulage is conducted from rooms to general sidetrack, a distance of 800 feet, by mules; and from general sidetrack to tipple, a distance of 6,500 feet, by motors.

CLAIBORNE COUNTY.

Fork Ridge No. 2 Mine—*Owner,* American Association (Incorporated), Middlesboro, Ky.; *Operator,* Fork Ridge Coal & Coke Co., Fork Ridge; *President,* C. S. McManus, Knoxville; *Secretary,* B. T. Milam, Middlesboro, Ky.; *Superintnedent;* A. H. Rennebaum, Middlesboro, Ky.; *Inside Foreman,* H. C. Farmer, Fork Ridge.

This is a Class C. Drift mine, located 1,600 feet above sea level, in Mingo Mountain, ¼ mile from Fork Ridge, and connects with L. & N. and Southern Railroads. The Mingo seam, having an average thickness of 52 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the double entry system. Ventilation is produced by fan with a diameter of 14 feet, and is distributed as continuous current. Haulage is conducted from rooms to sidetrack, a distance of 700 feet, by mules; and from general sidetrack to tipple, a distance of 6,500 feet, by motors.

CLAIBORNE COUNTY.

Fork Ridge No. 3 Mine—*Owner,* American Association (Incorporated), Middlesboro; Ky.; *Operator,* Fork Ridge Coal & Coke Co., Fork Ridge; *President,* C. S. McManus, Knoxville; *Secretary,* B. T. Milam, Middlesboro, Ky.; *Superintendent,* A. H. Rennebaum, Middlesboro, Ky.; *Inside Foreman,* H. C. Denny, Fork Ridge.

This is a Class C drift mine, located 2,500 feet above sea level, in Bryson Mountain, 1½ miles from Fork Ridge, and connects with L. & N. and Southern Railroads. The Lower Hignite seam, having an average thickness of 48 inches, is worked. The roof is slate and sandstone, and the bottom slate. It is developed on the double entry system. Ventilation is produced by fan with a diameter of 10 feet, and is distributed by the split system. Haulage is conducted from rooms to mine entrance, a distance of 2,600 feet, by motors; from mine entrance to incline, a distance of 400 feet, by motors; and from incline to tipple, a distance of 2,200 feet, by gravity.

CLAIBORNE COUNTY.

King Mountain Mine—*Owner,* American Association (Incorporated), Middlesboro, Ky.; *Operator,* King Mountain Coal Co., Clairfield; *President,* G. W. Easton, Tazewell, *Secretary,* G. W. Montgomery, Tazewell; *Superintendent,* N. L. Reynolds, Clairfield; *Inside Foreman,* Sam Marion, Clairfield.

This is a Class C drift mine, located 1,350 feet above sea level, in Log Mountain, ¼ mile from Clairfield, and connects with L. & N. and Southern R. R.'s. The Jellico seam, having an average thickness of 40 inches, is worked. The roof is slate and the bottom slate and fire clay. It is developed on the single entry system. Ventilation is produced by furnace with a grate area of 35 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, by mules; and from knuckle to main siding, a distance of 2,600 feet, by tail rope. All gathering is done with mules.

CLAIBORNE COUNTY.

Mingo No. 1 Mine—*Owner,* American Association (Incorporated), Middlesboro, Ky.; *Operator,* Mingo Coal & Coke Co., Hartranft; *President,* R. L. Ralston, Hartranft; *Inside Foreman,* Bob Jones, Hartranft.

This is a Class C drift mine, located 1,600 feet above sea level, in Bryson Mountain, ½ mile from Hartranft, and connects with L. & N. and Southern Railroads. The

No. 1 seam, having an average thickness of 60 inches, is worked. The roof is sandstone and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace with a grate area of —— feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of —— feet, by mules.

CLAIBORNE COUNTY.

Mingo No. 2 Mine—*Owner,* American Association (Incorporated), Middlesboro, Ky.; *Operator,* Mingo Coal & Coke Co. (under contract with A. Davis), Hartranft; *President,* R. L. Ralston, Hartranft; *Inside Foreman,* Zack Ralston, Hartranft.

This is a Class C drift mine, located 1,600 feet above sea level, in Bryson Mountain, ½ mile from Hartranft, and connects with L. & N. and Southern Railroads. The Mingo No. 1 seam, having an average thickness of 60 inches, is worked. The roof is sandstone and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by fan with a diameter of —— feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of —— feet, by mules.

CLAIBORNE COUNTY.

Mingo No. 3 Mine—*Owner,* American Association (Incorporated), Middlesboro, Ky.; *Operator,* Mingo Coal & Coke Co., Hartranft; *President,* R. L. Ralston, Hartranft; *Inside Foreman,* Bob Jones, Hartranft.

This is a Class C drift mine, located 2,250 feet above sea level, in Bryson Mountain, ½ mile from Hartranft, and connects with L. & N. and Southern Railroads. The Mingo No. 2 seam, having an average thickness of 60 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace with a grate area of 20 feet, and is distributed as continuous current. Haulage is conducted from rooms to drum house, a distance of 900 feet, by mules; from drum house to foot of incline, a distance of 1,200 feet, by monitor cars; and from foot of incline to washer, a distance of 1,980 feet, by tram.

CLAIBORNE COUNTY.

Mingo No. 5 Mine—*Owner,* American Association (Incorporated), Middlesboro, Ky.; *Operator,* Mingo Coal & Coke Co., Hartranft; *President,* R. L. Ralston, Hartranft; *Secretary,* G. W. Lewis, Louisville, Ky.; *Superintendent,* Z. T. Ralston, Hartranft; *Inside Foreman,* John Minton, Hartranft.

This is a Class C drift mine, located 2,280 feet above sea level, in Mingo Mountain, ½ mile from Hartranft, and connects with L. & N. and Southern Railroads. The Poplar Lick seam, having an average thickness of 54 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry and pillar system. Ventilation is produced by fan with a diameter of 7 feet. Haulage is conducted from rooms to main entrance, a distance of 2,400 feet, by mules; and from main entrance to foot of incline, a distance of 2,100 feet, by gravity.

CLAIBORNE COUNTY.

New Jellico Mine—*Owner,* R. B. Marsee, Clairfield; *Operator,* New Jellico Coal Co., Clairfield; *President,* Joe Vasey, Clairfield; *Secretary and Superintendent,* Richard Rigby, Clairfield; *Inside Foreman,* Walter Nunn, Clairfield.

This is a Class C drift mine, located 1,425 feet above sea level, in King Mountain, 1 mile from Clairfield, and connects with Southern and L. & N. Railroads. The Jellico seam, having an average thickness of 33 inches is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by furnace with a grate area of 48 feet, and is distributed as continuous current. Haulage is conducted from rooms to tipple, a distance of 1,000 feet, by mules.

CLAIBORNE COUNTY.

Nicholson No. 2 Mine—*Owner,* American Association (Incorporated), Middlesboro, Ky.; *Operator,* Nicholson Coal Co., Nicholson; *President,* J. C. Cardwell, Louisville, Ky.; *Secretary,* P. T. Colgan, Middlesboro, Ky.; *Superintendent,* E. R. Short, Nicholson, *Inside Foreman,* George Maden, Nicholson.

This is a Class C drift mine, located 1,800 feet above sea level, in Mingo Mountain, ¼ mile from Nicholson, and connects with L. & N. and Southern Railroads. The Sandstone Parting seam, having an average thickness of 60 inches, is worked. The roof is stone and the bottom fire clay. It is developed on the double entry system. Ventilation is produced by fan with a diameter of 7 feet, and is distributed as con-

tinuous current. Haulage is conducted from room to sidetrack, a distance of 1,000 feet, by mules; from sidetrack to entrance, a distance of 900 feet, by mules; from entrance to knuckle, a distance of 900 feet, by mules; and from knuckle to railroad, a distance of 2,000 feet, by gravity.

CLAIBORNE COUNTY.

Nicholson No. 3 Mine—*Owner,* American Association (Incorporated), Middlesboro, Ky.; *Operator,* Nicholson Coal Co., Nicholson; *President,* J. C. Cardwell, Louisville, Ky.; *Secretary,* P. T. Colgan, Middlesboro, Ky.; *Superintendent,* E. R. Short, Nicholson, *Inside Foreman,* George Maden, Nicholson.

This is a Class C drift mine, located 2,030 feet above sea level, in Mingo Mountain, ¼ mile from Nicholson, and connects with L. & N. and Southern Railroads. The Nicholson seam, having an average thickness of 60 inches. is worked. The roof is slate and the bottom fire clay. It is developed on the double entry system. Ventilation is produced by fan with a diameter of 7 feet, and is distributed as continuous current. Haulage is conducted from rooms to entrance, a distance of 600 feet, by mules; from entrance to knuckle, a distance of 3,500 feet, by locomotive; and from knuckle to railroad, a distance of 3,400 feet, by gravity incline.

CLAIBORNE COUNTY.

Pruden Mine—*Owner,* American Association (Incorporated), Middlesboro, Ky.; *Operator,* Pruden Coal & Coke Co., Knoxville; *President,* Thomas Pruden, Knoxville; *Secretary,* Joseph P. Gaut, Knoxville; *Superintendent,* George M. Wallen, Pruden; *Inside Foreman,* Rufe Speaks, Pruden.

This is a Class C drift mine, located 1,700 feet above sea level, in Bryson Mountain, 20 miles from Jellico, and connects with L. & N. and Southern Railroads. The Mingo seam, having an average thickness of 60 inches, is worked. The roof is slate and the bottom slate. It is developed on the room and pillar system. Ventilation is produced by fan with a diameter of 12 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 1,000 feet, by mules; from sidetrack to tipple, a distance of 5,280 feet, by motors; and from tipple to railroad chute, a distance of 1,500 feet, by monitors.

CLAIBORNE COUNTY.

Reliance No. 1-2 Mine—*Owner,* American Association (Incorporated), Middlesboro, Ky.; *Operator,* Reliance Coal & Coke Co., Hartranft; *President,* George Walter Whiteman, Philadelphia, Pa.; *Secretary,* Daniel Cooper Swab, Hartranft; *Superintendent,* J. B. Robinson, Hartranft; *Inside Foreman,* George L. Bell, Hartranft.

This is a Class C drift mine, located 1,600 feet above sea level, in Mullin's Spur of Bryson Mountain, at Hartranft, and connects with L. & N. and Southern Railroads. The Mingo seam, having an average thickness of 60 inches, is worked. The roof is slate and the bottom slate. It is developed on the double entry system. Ventilation is produced by fan with a diameter of 8 feet, and by furnace with a grate area of 54 feet, and is distributed as continuous current. Haulage is conducted from rooms to sidetrack, a distance of 500 feet, by mules; from sidetrack to tipple, a distance of 3,000 feet, by wireless rope; from tipple to railroad, a distance of 75 feet, by chute; from rooms to sidetrack, a distance of 700 feet, by mules; and from sidetrack to tipple, a distance of 1,800 feet, by wireless rope.

CLAIBORNE COUNTY.

Reliance No. 3 Mine—*Owner,* American Association (Incorporated), Middlesboro, Ky.; *Operator,* Reliance Coal & Coke Co., Hartranft; *President,* George Walter Whiteman, Philadelphia. Pa.; *Secretary,* Daniel Cooper Swab, Hartranft; *Superintendent,* J. B. Robinson, Hartranft; *Inside Foreman,* George L. Bell, Hartranft.

This is a Class C drift mine, located 1,885 feet above sea level, in Mullin's Spur of Bryson Mountain, at Hartranft, and connects with L. & N. and Southern Railroads. The Sandstone Parting seam, having an average thickness of 65 inches, is worked. The roof is slate and the bottom slate. It is developed on the double entry system. Ventilation is produced by furnace with a grate area of 48 feet, and is distributed as continuous current. Haulage is conducted from face of entries to outside, a distance of 600 feet, by mules; and from drift mouth to tipple, a distance of 600 feet, by mules. There is nothing being worked in this mine but entries which will be driven to the barrier before any rooms are turned.

CLAIBORNE COUNTY.

Standard Mine—*Owner,* American Association (Incorporated), Middlesboro, Ky.; *Operator,* Standard Coal & Coke Co., Clairfield; *President,* Charles F. Eager, Knoxville; *Secretary,* H. M. Axline, Middlesboro, Ky.; *Superintendent,* Gideon T. Spencer, Clairfield; *Inside Foreman,* Jake Q. Angel, Clairfield.

This is a Class C drift mine, located 1,100 feet above sea level, in a spur of Log Mountain, 14 miles from Jellico, and connects with L. & N. and Southern Railroads. The Jellico seam, having an average thickness of 40 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the room and pillar system. Ventilation is produced by fan with a diameter of 6 feet, and is distributed as continuous current. Haulage is conducted from rooms to knuckle, a distance of 1,000 feet, by mules; and from knuckle to sidetrack, a distance of 850 feet, by gravity.

CLAIBORNE COUNTY.

Sterling No. 1-2 Mine—*Owner,* American Association (Incorporated), Middlesboro, Ky.; *Operator,* Sterling Coal & Coke Co., Manring; *President,* C. S. McManus, Manring; *Secretary,* M. H. McCorkle, Manring; *Superintendent,* Walter H. Finley, Manring; *Inside Foreman,* W. T. Robinson, Manring.

This is a Class C drift mine, located 2,300 feet above sea level, in Log Mountain, at Manring, and connects with Southern Railroad. The Sterling seam, having an average thickness of 5 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the room and panel retreating by panels system. Ventilation is produced by fan with a diameter of 8 feet, and is distributed by the double entry split system. Haulage is conducted from face to small sidings, a distance of 500 feet, by mules; from sidings to main siding, a distance of 2,000 feet, by 5-ton motors; and from main siding to tipple, a distance of 4,000 feet, by 10-ton motors.

CLAIBORNE COUNTY.

Yellow Creek No. 2 Mine—*Owner,* American Association (Incorporated), Middlesboro, Ky.; *Operator,* Yellow Creek Coal Co., Middlesboro, Ky.; *President,* John G. Fitzpatrick, Middlesboro, Ky.; *Secretary,* James F. Bosworth, Bosworth, Ky.; *Inside Foreman,* M. Rockwell, Bosworth, Ky.

This is a Class C drift mine, located 1,800 feet above sea level, in Mingo Mountain, 5 miles from Middlesboro, Ky., and connects with L.& N. and Southern Railroads. The Jack Rock seam, having an average thickness of 54 inches, is worked. The roof is sandrock and the bottom fire clay. It is developed on the double entry, room and pillar system. Ventilation is produced by fan with a diameter of 7 feet, and is distributed by the split system. Haulage is conducted from main siding to tipple, a distance of 1,500 feet, by motors; from left siding to tipple, a distance of 1,500 feet, by motors; and from right siding to tipple, a distance of 1,200 feet, by motors.

CLAIBORNE COUNTY.

Yellow Creek No. 3 Mine—*Owner,* American Association (Incorporated), Middlesboro, Ky.; *Operator,* Yellow Creek Coal Co., Middlesboro, Ky.; *President,* John G. Fitzpatrick, Middlesboro, Ky.; *Secretary,* James F. Bosworth, Bosworth, Ky.; *Inside Foreman,* D. B. Malbucht, Bosworth, Ky.

This is a Class C drift mine, located 2,275 feet above sea level, in Mingo Mountain, 5½ miles from Middlesboro, Ky., and connects with Southern and L. & N. Railroads. The Poplar Lick seam, having an average thickness of 68 inches, is worked. The roof is blue slate and the bottom slate. It is developed on the room and pillar system. Ventilation is produced by fan with a diameter of 5 feet, and is distributed by the split system. Haulage is conducted from rooms to main entry, a distance of 500 feet, by mules; and from main entry to tipple, a distance of 2,500 feet, by locomotive.

CUMBERLAND COUNTY.

Clear Creek No. 1 Mine—*Owner and Operator,* Clear Creek Coal & Lumber Co., Isoline; *President,* J. E. Cummins, Columbus, Ohio; *Secretary,* D. W. Jones, Columbus, Ohio; *Superintendent and Inside Foreman,* S. L. Winborger, Isoline.

This is a Class B slope mine, located 1,900 feet above sea level, in Cumberland Mountain, at Isoline, and connects with Tennessee Central Railroad. The Isoline seam, having an average thickness of 44 inches, is worked. The roof is shale and the bottom shale and sandstone. It is developed on the entry and air course system with rooms turned both sides of cross entries. Ventilation is produced by fan with a diameter of 15 feet, and is distributed by the split system. Haulage is conducted

from rooms to foot of slope, a distance of 1,500 feet, by mules; and from foot of slope to tipple, a distance of 400 feet, by rope.

CUMBERLAND COUNTY.

Clear Creek No. 5 Mine—*Owner and Operator,* Clear Creek Coal & Lumber Co., Isoline; *President, J. E. Cummins,* Columbus, Ohio; *Secretary,* L. L. Hudson, Columbus, Ohio; *General Manager,* J. L. Barr, Isoline; *Inside Foreman,* S. L. Umbarger, Isoline.

This is a Class B slope mine, located 1,900 feet above sea level, in Cumberland Mountain, at Isoline, and connects with Tennessee Central Railroad. The Isoline seam, having an average thickness of 38 inches, is worked. The roof is shale and the bottom shale and sandstone. It is developed on the entry and air course system with rooms turned both sides of X entries. Ventilation is produced by fan with a diameter of 15 feet, and is distributed by the split system. Haulage is conducted from rooms to foot of slope, a distance of 2,250 feet, by mules; and from foot of slope to tipple, a distance of 400 feet, by rope.

CUMBERLAND COUNTY.

Fall Creek Mine—*Owner and Operator,* Fall Creek Collieries, Ozone; *President,* N. C. Chapman, St. Louis, Mo.; *Superintendent,* E. G. Tollett, Crossville.

This is a Class C drift mine, located 2,000 feet above sea level, in Cumberland Mountain, 2½ miles from Ozone, and connects with Tennessee Central Railroad. The Big Sewanee seam, having an average thickness of 60 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry, room and pillar system. Ventilation is produced by furnace with a grate area of 40 feet. Haulage is conducted from rooms to tipple, a distance of ——, by mules.

CUMBERLAND COUNTY.

Renfro Mine—*Owner,* H. A. Butler, Mauch Chunk, Pa.; *Operator,* Renfro Coal & Coke Co., Ozone; *President,* H. A. Butler, Mauch Chunk, Pa.; *Secretary,* H. L. Pabst, Mauch Chunk, Pa.

This is a Class C drift and slope mine, located 1,800 feet above sea level, in Cumberland Mountain, 3 miles from Crab Orchard, and connects with Tennessee Central Railroad. The Sewanee seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the room and pillar system. Ventilation is produced by fan with a diameter of 10 feet. Haulage is conducted from rooms to slope, a distance of 600 feet, by mules; from slope to tipple, a distance of 800 feet, by cable; and from tipple to railroad, a distance of 300 feet, by mules.

CUMBERLAND COUNTY.

Waldensia Mine—*Owner,* Chicago-Tennessee Coal & Coke Co., Chicago, Ill.; *Operator,* Waldensia Coal & Coke Co., Waldensia; *President and Superintendent,* R. Ellison, Cincinnati, Ohio; *Secretary,* R. A. Colter, Cincinnati, Ohio.

This is a Class B slope mine, located 1,900 feet above sea level, in Cumberland Mountain, 3 miles from Waldensia, and connects with Tennessee Central Railroad. The Big Sewanee seam, having an average thickness of 72 inches, is worked. The roof is slate and the bottom sand rock. It is developed on the entry and air course system. Ventilation is produced by furnace with a grate area of 36 feet. Haulage is conducted from rooms to slope, a distance of 800 feet, by mules; and from slope to tipple, a distance of 2,500 feet, by drop rope.

FENTRESS COUNTY.

Fentress No. 1 Mine—*Owner and Operator,* Fentress Coal & Coke Co., Wilder; *President,* G. H. Taylor, Philadelphia, Pa.; *Secretary,* J. G. Taylor, Philadelphia, Pa.; *Superintendent,* Joseph Cain, Wilder; *Inside Foreman,* Alvin Adkins, Wilder.

This is a Class B drift mine, located 1,620 feet, above sea level, in Cumberland Mountain, at Wilder, and connects with Tennessee Central Railroad. The No. 2 Bon Air seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the double entry, single room system. Ventilation is produced by fan with a diameter of 7 feet, and is distributed by the split system. Haulage is conducted from face to tipple, a distance of 7,000 feet, by motors.

FENTRESS COUNTY.

Fentress No. 2 Mine—*Owner and Operator,* Fentress Coal & Coke Co., Wilder; *President,* G. H. Taylor, Philadelphia, Pa.; *Secretary,* J. G. Taylor, Philadelphia, Pa.; *Superintendent,* Joseph Cain, Wilder; *Inside Foreman,* Alvin Adkins, Wilder.

This is a Class B drift mine, located 1,653 feet above sea level, in Cumberland Mountain, at Wilder, and connects with Tennessee Central Railroad. The No. 2 Bon Air seam, having an average thickness of 54 inches, is worked. The roof is slate and the bottom rock. It is developed on the single entry system. Ventilation is produced by fan with a diameter of 10 feet, and is distributed as continuous current. Haulage is conducted from rooms to portal, a distance of 800 feet, by mules; and from portal to tipple, a distance of 795 feet, by mules.

GRUNDY COUNTY.

Clouse Hill No. 1-2 Mine—*Owner and Operator,* Sewanee Fuel & Iron Co., Coalmont; *President,* F. B. Martin, Chattanooga; *Superintendent and Inside Foreman,* J. M. Sehorn, Coalmont.

This is a Class C drift mine, located 1,950 feet above sea level, in Cumberland Mountain, 4 miles from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom slate. It is developed on the single entry system. Ventilation is produced by furnace with a grate area of 48 feet and by natural conditions, and is distributed by air courses. Haulage is conducted from tipple to working face, a distance of 3,500 feet, by mules.

GRUNDY COUNTY.

Coalmont B Mine—*Owner and Operator,* Sewanee Fuel & Iron Co., Coalmont; *President,* F. B. Martin, Chattanooga; *Secretary,* Earl Martin, Chattanooga; *Superintendent,* H. S. Walden, Coalmont; *Inside Foreman,* J. M. Sehorn, Coalmont.

This is a Class C drift mine, located 1,904 feet above sea level, in Cumberland Mountain, ½ mile from Coalmont, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom stone. It is developed on the single entry and air course system. Ventilation is produced by furnace with a grate area of 48 feet. Haulage is conducted from 12th left to 3rd siding, a distance of 1,700 feet, by mules; from 3rd siding to 2nd siding, a distance of 1,350 feet, by mules; from 2nd siding to 1st siding, a distance of 750 feet, by mules; and from 1st siding to tipple, a distance of 1,400 feet, by mules.

GRUNDY COUNTY.

Coalmont H Mine—*Owner and Operator,* Sewanee Fuel & Iron Co., Coalmont; *President,* F. B. Martin, Chattanooga; *Secretary,* Earl Martin, Chattanooga; *Superintendent,* H. S. Walden, Coalmont; *Inside Foreman,* J. M. Sehorn, Coalmont.

This is a Class C drift mine, located 1,923 feet above sea level, in Cumberland Mountain, ½ mile from Coalmont, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 32 inches, is worked. The roof is slate and the bottom slate. It is developed on the single entry system. Ventilation is produced by furnace with a grate area of 48 feet, and is distributed by air courses. Haulage is conducted from heading to second siding, a distance of 650 feet, by mules; from second siding to first siding, a distance of 1,300 feet, by mules; and from first siding to tipple, a distance of 1,600 feet, by mules.

GRUNDY COUNTY.

Coalmont O Mine—*Owner and Operator,* Sewanee Fuel & Iron Co., Coalmont; *President,* F. B. Martin, Chattanooga; *Secretary,* Earl Martin, Chattanooga; *Superintendent,* H. S. Walden, Coalmont; *Inside Foreman,* J. M. Sehorn, Coalmont.

This is a Class C drift mine, located 1,907 feet above sea level, in Cumberland Mountain, ½ mile from Coalmont, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 30 inches is worked. The roof is slate and the bottom slate. It is developed on the single entry and air course system. Ventilation is produced by furnace with a grate area of 48 feet. Haulage is conducted from head right 6th to second siding, a distance of 1,800 feet, by mules; from second siding to first siding, a distance of 890 feet, by mules; and from first siding to tipple, a distance of 400 feet, by mules.

GRUNDY COUNTY.

East Fork Mine—*Owner and Operator,* Tennessee Consolidated Coal Co., Tracy City; *President,* E. L. Hampton, Tracy City; *Secretary,* G. M. Thorogood, Tracy City; *Superintendent,* R. B. Roberts, Tracy City; *Inside Foreman,* W. G. Parsons, Tracy City.

This is a Class D drift mine, located 1,900 feet above sea level, in Cumberland Mountain, 1 mile from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 42 inches, is worked. The roof is slate and sandrock and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from main entry to sidetrack, a distance of 1,800 feet, by mules; and from sidetrack to tipple, a distance of 1,700 feet, by mules.

GRUNDY COUNTY.

East Staub Mine—*Owner and Operator,* Tennessee Consolidated Coal Co., Tracy City; *President,* E. L. Hampton, Tracy City; *Secretary,* G. M. Thorogood, Tracy City; *Superintendent,* R. B. Roberts, Tracy City; *Inside Foreman,* W. Atmond, Tracy City.

This is a Class D drift mine, located 1,900 feet above sea level, in Cumberland Mountain, 3 miles from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to tipple, an average distance of 2,000 feet, by mules.

GRUNDY COUNTY.

Ferguson Mine—*Owner,* J. B. Ferguson, Coalmont; *Operator, Superintendent and Inside Foreman,* J. A. Harrison, Coalmont.

This is a Class C drift mine, located 1,900 feet above sea level, in Cumberland Mountain, ½ mile from Coalmont, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 41 inches, is worked. The roof is slate and sandrock and the botom slate and clay. It is developed on the single entry system. Ventilation is produced by furnace with a grate area of 100 feet. Haulage is conducted from head of entry to tipple, a distance of 700 feet, by mules.

GRUNDY COUNTY.

Flat Branch Mine—*Owner and Operator,* Flat Branch Coal Co., Meeks; *President,* Dr. D. H. Thomas, Columbus, Ohio; *Superintendent,* W. H. Workman, Meeks; *Inside Foreman,* W. S. Orange, Meeks.

This is a Class C drift mine, located 1,900 feet above sea level, in Cumberland Mountain, 1 mile from Meeks, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 32 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the single entry system. Ventilation is produced by furnace with a grate area of 30 feet, and is distributed by the split system. Haulage is conducted from rooms to tipple, a distance of 2,700 feet, by mules.

GRUNDY COUNTY.

Hampton Mine—*Owner and Operator,* W. H. Hampton, Tracy City; *Inside Foreman,* M. Stotts, Tracy City.

This is a Class D drift mine, located 1,940 feet above sea level, in Cumberland Mountain, 5 miles from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 36 inches is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to tipple, a distance of 1,200 feet, by mules.

GRUNDY COUNTY.

Henley Mine—*Owner and Operator,* Tennessee Consolidated Coal Co., Tracy City; *President,* E. L. Hampton, Tracy City; *Secretary,* G. M. Thorogood, Tracy City; *Superintendent,* R. B. Roberts, Tracy City; *Inside Foreman,* S. L. Lowery, Tracy City.

This is a Class D drift mine, located 1,962 feet above sea level, in Cumberland Mountain, 1½ miles from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 42 inches, is worked. The roof is slate and sandrock and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to tipple, a distance of 2,100 feet, by mules.

GRUNDY COUNTY.

Lone Rock Mine—*Owner and Operator,* Tennessee Consolidated Coal Co., Tracy City; *President,* E. L. Hampton, Tracy City; *Secretary,* G. M. Thorogood, Tracy City; *Superintendent,* R. B. Roberts, Tracy City; *Inside Foreman,* W. C. Parsons, Tracy City.

This is a Class C drift mine, located 1,960 feet above sea level, in Cumberland Mountain, 1 mile from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 42 inches, is worked. The roof is slate and sandrock and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to tipple, a distance of 5,000 feet, by mules.

Note—All rob work.

GRUNDY COUNTY.

Nunley Mine—*Owner and Operator,* Tennessee Consolidated Coal Co., Tracy City; *President,* E. L. Hampton, Tracy City; *Secretary,* G. M. Thorogood, Tracy City; *Superintendent,* R. B. Roberts, Tracy City; *Inside Foreman,* J. D. Wiley, Tracy City.

This is a Class D drift mine, located 1,970 feet above sea level, in Cumberland Mountain, 2 miles from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to tipple, a distance of 4,500 feet, by mules.

Note—All rob work.

GRUNDY COUNTY.

Ramsey No. 1 Mine—*Owner and Operator,* Tennessee Consolidated Coal Co., Tracy City; *President* E. L. Hampton, Tracy City; *Secretary,* G. M. Thorogood, Tracy City; *Superintendent,* R. B. Roberts, Tracy City; *Inside Foreman,* J. D. Wiley, Tracy City.

This is a Class C drift mine, located 1,860 feet above sea level, in Cumberland Mountain, 3 miles from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to tipple, a distance of 2,400 feet, by mules.

GRUNDY COUNTY.

Ramsey (West) Mine—*Owner and Operator,* Tennessee Consolidated Coal Co., Tracy City; *President* E. L. Hampton, Tracy City; *Secretary,* G. M. Thorogood, Tracy City; *Superintendent,* R. B. Roberts, Tracy City; *Inside Foreman,* J. D. Wiley, Tracy City.

This is a Class D drift mine, located 1,875 feet above sea level, in Cumberland Mountain, 3 miles from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from main entry to tipple, a distance of 1,200 feet, by mules; (outside haul, 800 feet).

Note—All rob work.

GRUNDY COUNTY.

Reid Hill No. 1 Mine—*Owner and Operator,* Tennessee Consolidated Coal Co., Tracy City; *President* E. L. Hampton, Tracy City; *Secretary,* G. M. Thorogood, Tracy City; *Superintendent,* R. B. Roberts, Tracy City; *Inside Foreman,* S. L. Lowery, Tracy City.

This is a Class C drift mine, located 1,910 feet above sea level, in Cumberland Mountain, 1 mile from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom slate and fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by 2 furnaces with a combined grate area of 176 feet, and is distribtued by the split system. Haulage is conducted from right 8 and crosses main sidetrack, a distance of 900 feet, by mules; from left entries to main sidetrack, a distance of 1,000 feet, by mules; from right 6 and marler to main sidetrack, a distance of 1,200 feet, by mules; and from main sidetrack, to tipple, a distance of 1,085 feet, by mules.

GRUNDY COUNTY.

Street Hill Mine—*Owner and Operator,* Tennessee Consolidated Coal Co., Tracy City; *President* E. L. Hampton, Tracy City; *Secretary,* G. M. Thorogood, Tracy City; *Superintendent,* R. B. Roberts, Tracy City; *Inside Foreman,* J. D. Wiley, Tracy City.

This is a Class D drift mine, located 1,900 feet above sea level, in Cumberland Mountain, 1 mile from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom slate. It is developed on the room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from main entry to tipple, a distance of 600 feet, by mules.

GRUNDY COUNTY.

Werner Mine—*Owner and Operator,* Tennessee Consolidated Coal Co., Tracy City; *President,* E. L. Hampton, Tracy City; *Secretary,* G. M. Thorogood, Tracy City; *Superintendent,* R. B. Roberts, Tracy City; *Inside Foreman,* W. C. Parsons, Tracy City.

This is a Class D drift mine, located 1,965 feet above sea level, in Cumberland Mountain, 1 mile from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 36 inches, is worked. The roof is slate and sandrock and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by natural conditions Haulage is conducted from rooms to tipple, a distance of 2,400 feet, by mules.

HAMILTON COUNTY.

Daisy Mine—*Owner,* Charles E. Allen, Daisy; *Operators,* T. A. & W. A. Alexander, Daisy; *Superintendent and Inside Foreman,* T. A. Alexander, Daisy.

This is a Class D drift mine, located 1,625 feet above sea level, in Waldens Ridge, 3 miles from Daisy, and connects with the C. N. O. & T. P. R. R. The No. 10 seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to portal, a distance of 200 feet, by mules, and hauled to Daisy, a distance of 3 miles, and sold to local trade.

HAMILTON COUNTY.

Big Soddy A Mine—*Owner and Operator,* Durham Coal & Iron Co., Chattanooga; *President,* Charles B. Eddy, Chattanooga; *Secretary,* Max Milligan, Chattanooga; *Superintendent,* Robt. Pettigrew, Chattanooga; *Inside Foreman,* J. B. Mansfield, Soddy.

This is a Class C drift mine, located 1,286 feet above sea level, in Waldens Ridge, 2½ miles from Soddy, and connects with C. N. O. & T. P. Ry. Co. The No. 10 seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the double entry, room and pillar system. Ventilation is produced by furnace with a grate area of 25 feet, and is distributed as coninuous current. Haulage is conducted from rooms to mine entrance, a distance of 800 feet, by mules; from mine entrance to incline, a distance of 1,500 feet, by mules; and from incline to tipple, a distance of 850 feet, by rope.

HAMILTON COUNTY.

Big Soddy B Mine—*Owner and Operator,* Durham Coal & Iron Co., Chattanooga; *President,* Charles B. Eddy, Chattanooga; *Secretary,* Max Milligan, Chattanooga; *Superintendent,* Robt. Pettigrew, Chattanooga; *Inside Foreman,* J. B. Mansfield, Soddy.

This is a Class C drift mine, located 1,285 feet above sea level, in Waldens Ridge, 2½ miles from Soddy, and connects with C. N. O. & T. P. Ry. Co. The No. 10 seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the double entry, room and pillar system. Ventilation is produced by furnace with a grate area of 25 feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of 1,000 feet, by mules; from mine entrance to incline, a distance of 2,400 feet, by mules; and from incline to tipple, a distance, of 850 feet by rope.

HAMILTON COUNTY.

Big Soddy I Mine—*Owner and Operator,* Durham Coal & Iron Co., Chattanooga; *President,* Charles B. Eddy, Chattanooga; *Secretary,* Max Milligan, Chattanooga; *Superintendent,* Robt. Pettigrew, Chattanooga; *Inside Foreman,* J. B. Mansfield, Soddy.

This is a Class C drift mine, located 1,250 feet above sea level, in Waldens Ridge, 2½ miles from Soddy, and connects with C. N. O. & T. P. Ry. Co. The No. 9 seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the double entry, room and pillar system. Ventilation is produced by furnace with a grate area of 30 feet, and is distributed

as continuous current. Haulage is conducted from rooms to mine entrance, a distance of 1,600 feet, by mules; from mine entrance to incline, a distance of 700 feet, by mules; and from incline to tipple, a distance of 850 feet, by rope.

HAMILTON COUNTY.

Big Soddy No. 2 Mine—*Owner and Operator,* Durham Coal & Iron Co., Chattanooga; *President,* Charles B. Eddy, Chattanooga; *Secretary,* Max Milligan, Chattanooga; *Superintendent,* Robt. Pettigrew, Chattanooga; *Inside Foreman,* J. B. Mansfield, Soddy.

This is a Class C drift mine, located 1,250 feet above sea level, in Waldens Ridge, 2½ miles from Soddy, and connects with C. N. O. & T. P. Ry. Co. The No. 9 seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the double entry, room and pillar system. Ventilation is produced by furnace with a grate area of 25 feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of 1,000 feet, by mules; from mine entrance to incline, a distance of 100 feet, by mules; and from incline to tipple, a distance of 850 feet, by rope.

HAMILTON COUNTY.

Big Soddy No. 3 Mine—*Owner and Operator,* Durham Coal & Iron Co., Chattanooga; *President,* Charles B. Eddy, Chattanooga; *Secretary,* Max Milligan, Chattanooga; *Superintendent,* Robt. Pettigrew, Chattanooga; *Inside Foreman,* J. B. Mansfield, Soddy.

This is a Class C drift mine, located 1,250 feet above sea level, in Waldens Ridge, 2½ miles from Soddy, and connects with C. N. O. & T. P. Ry. Co. The No. 9 seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the double entry, room and pillar system. Ventilation is produced by furnace with a grate area of 25 feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of 850 feet, by mules; from mine entrance to incline, a distance of 500 feet, by mules; and from incline to tipple, a distance of 850 feet, by rope.

HAMILTON COUNTY.

Big Soddy No. 4 Mine—*Owner and Operator,* Durham Coal & Iron Co., Chattanooga; *President,* Charles B. Eddy, Chattanooga; *Secretary,* Max Milligan, Chattanooga; *Superintendent,* Robt. Pettigrew, Chattanooga; *Inside Foreman,* J. B. Mansfield, Soddy.

This is a Class C drift mine, located 1,250 feet above sea level, in Waldens Ridge, 2½ miles from Soddy, and connects with C. N. O. & T. P. Ry. Co. The No. 9 seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the double entry, room and pillar system. Ventilation is produced by furnace with a grate area of 25 feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of 800 feet, by mules; from mine entrance to incline, a distance of 1,800 feet, by mules; and from incline to tipple, a distance of 850 feet, by rope.

HAMILTON COUNTY.

Big Soddy No. 7 Mine—*Owner and Operator,* Durham Coal & Iron Co., Chattanooga; *President,* Charles B. Eddy, Chattanooga; *Secretary,* Max Milligan, Chattanooga; *Superintendent,* Robt. Pettigrew, Chattanooga; *Inside Foreman,* J. B. Mansfield, Soddy.

This is a Class C drift mine, located 1,200 feet above sea level, in Waldens Ridge, 2 miles from Soddy, and connects with the C. N. O. & T. P. Ry. Co. The No. 7 seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the double entry, room and pillar system. Ventilation is produced by furnace with a grate area of 30 feet, and is distributed as continuous current. Haulage is conducted from rooms to pit mouth, a distance of 1,000 feet, by mules; from pit mouth to incline, a distance of 700 feet, by mules; and from top of incline to tipple, a distance of 900 feet, by rope.

HAMILTON COUNTY.

Montlake Mine—*Owner and Operator,* Montlake Coal Co., Chattanooga; *President,* Carl White, Chattanooga; *Secretary,* P. A. Brandner, Chattangooa; *Superintendent,* W.E. Brinkerhoff, Montlake; *Inside Foreman,* H. W. Thurman, Montlake.

This is a Class C drift mine, located 1,650 feet above sea level, in Walden's Ridge, 1¾ miles from Montlake Switch, and connects with C. N. O. & T. P. Ry. Co. The No. 10 seam, having an average thickness of 38 inches, is worked. The roof is slate and the bottom slate. It is developed on the double and single entry, room and pillar

system. Ventilation is produced by fan with a diameter of 7 feet, and by furnace with a grate area of 24 feet, and is distributed as continuous current. Haulage is conducted from rooms to haulway, a maximum distance of 1,900 feet, by mules; from haulway to tipple, a distance of 3,000 feet, by tail rope; from tipple to foot of incline, a distance of 2,100 feet by drum; and from foot of tipple to C. N. O. & T. P. Ry. Co., a distance of 9,100 feet, by railroad.

HAMILTON COUNTY.

Sale Creek Mine—*Owner and Operator,* Durham Coal & Iron Co., Chattanooga; *President,* C. B. Eddy, Chattanooga; *Secretary,* Max Milligan, Chattanooga; *Superintendent,* Robt. Pettigrew, Chattanooga; *Inside Foreman,* Dan C. Parry, Sale Creek.

This is a Class C drift mine, located 875 feet above sea level, in Waldens Ridge, 1 mile from Sale Creek, and connects with C. N. O. & T. P. Ry. Co. The No. 2 seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the double entry, room and pillar system. Ventilation is produced by fan with a diameter of 10 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 1,800 feet, by mules; and from sidetrack to tipple, a distance of 3,600 feet, by rope.

HAMILTON COUNTY.

Soddy No. 1-2 Mine—*Owner and Operator,* Durham Coal & Iron Co., Chattanooga; *President,* C. B. Eddy, Chattanooga; *Secretary,* Max Milligan, Chattanooga; *Superintendent,* Robt. Pettigrew, Chattanooga; *Inside Foreman,* J. T. Olinger, Soddy.

This is a Class C drift mine, located 1,268 feet above sea level, in Waldens Ridge, 1¼ miles from Soddy, and connects with C. N. O. & T. P. Ry. Co. The No. 7 seam, having an average thickness of 27 inches, is worked. The roof is sandstone and the bottom sandstone. It is developed on the double entry and double room system. Ventilation is produced by 4 fans with a diameter of 4 feet each, and is distributed as continuous current. Haulage is conducted from rooms to first sidetrack, a distance of 1,800 feet, by mules; from first sidetrack to second sidetrack, a distance of 5,000 feet, by rope; from second sidetrack to general sidetrack, a distance of 5,000 feet, by motors; and from general sidetrack to tipple, a distance of 7,200 feet, by rope.

HAMILTON COUNTY.

Soddy No. 4 Mine—*Owner and Operator,* Durham Coal & Iron Co., Chattanooga; *President,* C. B. Eddy, Chattanooga; *Secretary,* Max Milligan, Chattanooga; *Superintendent,* Robt. Pettigrew, Chattanooga; *Inside Foreman,* R. L. Woods, Soddy.

This is a Class C drift mine, located 1,270 feet above sea level, in Walden's Ridge, 1 mile from Soddy, and connects with C. N. O. & T. P. Ry. Co. The No. 7 seam, having an average thickness of 34 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the room and pillar system. Ventilation is produced by furnace with a grate area of 25 feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of 600 feet, by mules; from mine entrance to sidetrack, an average distance of 1,200 feet, by mules; from sidetrack to incline, a distance of 2,200 feet, by locomotive; and from bottom of incline to tipple, a distance of 3,200 feet, by rope.

HAMILTON COUNTY.

Soddy No. 5 Mine—*Owner and Operator,* Durham Coal & Iron Co., Chattanooga; *President,* C. B. Eddy, Chattanooga; *Secretary,* Max Milligan, Chattanooga; *Superintendent,* Robt. Pettigrew, Chattanooga; *Inside Foreman,* J. T. Olinger, Soddy.

This is a Class C drift mine, located 1,388 feet above sea level, in Waldens Ridge, 1½ miles from Soddy, and connects with C. N. O. & T. P. Ry. Co. The No. 10 seam, having an average thickness of 28 inches, is worked. The roof is slate and the bottom sandy shale. It is developed on the room and pillar system. Ventilation is produced by furnace with a grate area of 30 feet, and is distribtued by the split system. Haulage is conducted from rooms to mine entrance, a distance of 1,600 feet, by mules; from mine entrance to sidetrack, a distance of 1,500 feet, by rope; and from sidetrack to tipple, a distance of 7,200 feet, by rope.

HAMILTON COUNTY.

Soddy No. 9 Mine—*Owner and Operator,* Durham Coal & Iron Co., Chattanooga; *President,* C. B. Eddy, Chattanooga; *Secretary,* Max Milligan, Chattanooga; *Super-*

intendent, Robt. Pettigrew, Chattanooga; *Inside Foreman,* J. T. Olinger, Soddy.

This is a Class C drift mine, located 1,350 feet above sea level, in Waldens Ridge, 1½ miles from Soddy, and connects with C. N. O. & T. P. Ry. Co. The No. 9 seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the room and pillar system. Ventilation is produced by furnace with a grate area of 25 feet, and is distributed as continuous current. Haulage is conducted from rooms to pit mouth, a distance of 700 feet, by mules; from pit mouth to incline, a distance of 400 feet, by mules; from incline to sidetrack, a distance of 1,100 feet, by rope; and from sidetrack to tipple, a distance of 7,200 feet, by rope.

HAMILTON COUNTY.

Soddy No. 10 Mine—*Owner and Operator,* Durham Coal & Iron Co., Chattanooga; *President,* C. B. Eddy, Chattanooga; *Secretary,* Max Milligan, Chattanooga; *Superintendent,* Robt. Pettigrew, Chattanooga; *Inside Foreman,* J. T. Olinger, Soddy.

This is a Class C drift mine, located 1,380 feet above sea level, in Waldens Ridge, 1½ miles from Soddy, and connects with C. N. O. & T. P. Ry. Co. The No. 10 seam, having an average thickness of 28 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the room and pillar system. Ventilation is produced by furnace with a grate area of 20 feet, and is distributed as continuous current. Haulage is conducted from rooms to top incline, a distance of 1,800 feet, by mules; from top incline to bottom incline, a distance of 1,000 feet, by rope; and from bottom incline to tipple, a distance of 3,900 feet, by rope.

MARION COUNTY.

Battle Creek Mine—*Owner and Operator,* Battle Creek Coal & Coke Co., Orme; *President,* Roby Robinson, Atlanta, Ga.; *Secretary, V.-P. and Gen. Mgr.,* F. P. Thompson, Orme; *Superintendent and Inside Foreman,* Wm. McIntyre, Sr., Orme.

This is a Class C drift mine, located 1,650 feet above sea level, in Cumberland Mountain, 1 mile from Orme, and connects with C. N. O. & T. P. Ry. Co. The Battle Creek seam, having an average thickness of 60 inches, is worked. The roof is sandstone and slate and the bottom sandstone. It is developed on the double entry system. Ventilation is produced by fan with a diameter of 7 feet, and is distribtued by the split system. Haulage is conducted from mine to chute, a distance of 3,700 feet, by locomotive; and from chute to railroad, a distance of 3,300 feet, by incline.

MARION COUNTY.

New Etna No. 1 Mine—*Owner asd Operator,* New Etna Coal Co., Chattanooga; *President,* S. W. Hassell, New York City; *Secretary,* Frank H. Moffett, Whiteside; *Superintendent and Inside Foreman,* A. G. Stansberry, Whiteside.

This is a Class B drift mine, located 1,480 feet above sea level, in Cumberland Mountain, 2 miles from Whiteside, and connects with N., C. & St. L. Railway. The Kelly seam, having an average thickness of 32 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the single entry, room and pillar system. Ventilation is produced by entries through mountain giving direct ventilation, and is distributed as continuous current. Haulage is conducted from rooms to outside, a distance of 3,500 feet, by mules; from outside to drum, a distance of 23,760 feet, by locomotive; from drum to foot of incline, a distance of 4,200 feet, by gravity; and from foot of incline to railroad tipple, a distance of 3,800 feet, by locomotive.

MARION COUNTY.

New Etna No. 2 Mine—*Owner,* New Etna Coal Co., Chattanooga; *Operator,* New Etna Coal Co. under contract with C. A. Hall & Co., Whiteside; *President,* S. W. Hassell, New York City; *Secretary,* Frank H. Moffett, Whiteside; *Superintendent,* C. A. Hall, Whiteside; *Inside Foreman,* A. G. Stansberry, Whiteside.

This is a Class D drift mine, located 1,480 feet above sea level in Cumberland Mountain, 2 miles from Whiteside, and connects with N., C. & St. L. Railway. The Kelly seam, having an average thickness of 32 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace with a grate area of — feet, and is distributed as continuous current. Haulage is conducted from rooms to outside, a distance of 1,000 feet, by mules; from outside to tipple, a distance of 150 feet, by mules; from tipple to drum, a distance of 6,000 feet, by locomotive; from drum to foot of incline, a distance of 4,200 feet, by gravity; and from foot of incline to railroad tipple, a distance of 3,200 feet, by locomotive.

MARION COUNTY.

New Etna No. 4 Mine—*Owner and Operator,* New Etna Coal Co., Chattanooga; *President,* S. W. Hassell, New York City; *Secretary,* Frank H. Moffett, Whiteside; *Superintendent,* Thomas Degnan, Whiteside; *Inside Foreman,* J. T. Thomas, Whiteside.

This is a Class D slope mine, located 1,180 feet above sea level, in Cumberland Mountain, 1 mile from Whiteside, and connects with N., C. & St. L. Railway. The Kelly seam, having an average thickness of 32 inches, is worked. The roof is sandstone and the bottom slate. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace with a grate area of 120 feet, and is distributed as continuous current. Haulage is conducted from rooms to outside, a distance of 500 feet, by mules; from outside to incline, a distance of 200 feet, by mules; from top of incline to bottom of incline, a distance of 700 feet, by gravity; and from bottom of incline to railroad, a distance of 4,600 feet, by locomotive.

MARION COUNTY.

New Etna No. 5 Mine—*Owner,* New Etna Coal Co., Chattanooga; *Operator,* New Etna Coal Co., Chattanooga, under contract with J. C. Higdon at Roope; *President,* S. W. Hassell, New York City; *Secretary,* Frank H. Moffett, Whiteside; *Superintendent,* Thomas Degnan, Whiteside; *Inside Foreman,* J. C. Higdon, Roope.

This is a Class D slope mine, located 1,480 feet above sea level, in Cumberland Mountain, 2 miles from Roope, and connects with N., C. & St. L. Railway. The Kelly seam, having an average thickness of 32 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace with a grate area of 42 feet, and is distributed as continuous current. Haulage is conducted from rooms to outside, a distance of 700 feet, by mules; from outside to tip, a distance of 500 feet, by mules; from tip to drum, a distance of 18,480 feet, by locomotive; from drum to foot of incline, a distance of 3,400 feet, by gravity; and from foot of incline to railroad tipple, a distance of 3,800 feet, by locomotive.

MARION COUNTY.

Pryor Ridge No. 1 Mine—*Owner and Operator,* Nunley Ridge Coal Co., Tracy City; *President,* E. L. Hampton, Tracy City; *Secretary,* G. M. Thorogood, Tracy City; *Superintendent,* R. B. Roberts, Tracy City.

This is a Class C drift mine, located 1,841 feet above sea level, in Cumberland Mountain, 7 miles from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 42 inches, is worked. The roof is sandrock and slate and the bottom slate. It is developed on the room and pillar system. Ventilation is produced by fan with a diameter of 8 feet, and is distributed as continuous current. Haulage is conducted from main sidetrack to tipple, a distance of 800 feet, by mules; from right main entry to main sidetrack, a distance of 900 feet, by mules; and from left main entry to main sidetrack, a distance of 1,000 feet, by mules.

MARION COUNTY.

Pryor Ridge No. 2 Mine—*Owner and Operator,* Tennessee Consolidated Coal Co., Tracy City; *President,* E. L. Hampton, Tracy City; *Secretary,* G. M. Thorogood, Tracy City; *Superintendent,* R. B. Roberts, Tracy City; *Inside Foreman,* M. T. Tipton, Tracy City.

This is a Class C drift mine, located 1,850 feet above sea level, in Cumberland Mountain, 5 miles from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 36 inches, is worked. The roof is slate and sandrock and the bottom slate and fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace with a grate area of 48 feet, and is distributed as continuous current. Haulage is conducted from rooms to tipple, a distance of 820 feet, by mules.

MARION COUNTY.

Tennessee River Mine—*Owner and Operator,* Tennessee River Coal Co., South Pittsburg; *President,* Lewis Earle, New York City; *Secretary and Treasurer,* R. F. Kilpatrick, New York City, 35 Wall Street; *Superintendent,* G. H. Crozier, South Pittsburg; *Inside Foreman,* L. S. Bumgardner, South Pittsburg.

This is a Class C drift mine, located 1,600 feet above sea level, in Cumberland Mountain, 5 miles from South Pittsburg, and connects with N., C. & St. L. Railway. The Battle Creek seam, having an average thickness of 60 inches, is worked. The roof

is sandstone and the bottom sandstone and fire clay. It is developed on the double entry system. Ventilation is produced by fan with a diameter of 6 feet, and is distributed as continuous current. Haulage is conducted from rooms to portal, a distance of 1,575 feet, by mules; and from portal to railroad, a distance of 5,900 feet, by incline. Incline, 2,100 feet.

MARION COUNTY.

Thomas No. 1-2 Mine—*Owner and Operator,* Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.; *President,* George W. Crawford, Birmingham, Ala.; *Superintendent,* Thomas G. Fear, Whitwell, *Inside Foreman,* John W. Smith, Whitwell.

This is a Class B drift mine, located 1,764 feet above sea level, in Cumberland Mountain, 1 mile from Whitwell, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom fire clay and slate. It is developed on the single and double entry system. Ventilation is produced by fan with a diameter of 9 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 1,000 feet, by mules; from rooms to sidetrack No. 2, a distance of 1,600 feet, by motors; from sidetrack No. 1 to pit mouth, a distance of 6,900 feet, by motors; from pit mouth to tipple, a distance of 1,000 feet, by motors; from tipple to screens, a distance of 5,400 feet, by monitor cars.

MARION COUNTY.

Thomas No. 5 Mine—*Owner and Operator,* Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.; *President,* George W. Crawford, Birmingham, Ala.; *Superintendent,* Thomas G. Fear, Whitwell, *Inside Foreman,* John W. Smith, Whitwell.

This is a Class B drift mine, located 1,741 feet above sea level, in Cumberland Mountain, 2 miles from Whitwell, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom fire clay and slate. It is developed on the single and double entry system. Ventilation is produced by fan with a diameter of 9 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 900 feet, by mules; from siding to pit mouth, a distance of 2,000 feet, by motors; from pit mouth to tipple, a distance of —— feet, by motors; and from tipple to screens, a distance of —— feet, by monitor cars.

MORGAN COUNTY.

Babahatchie Mine—*Owner,* Babahatchie Coal Co., Harriman; *Operator,* Emory River Coal Co., Rockwood; *President,* W. J. Snow, Rockwood; *Secretary,* W. D. Kelly, Rockwood; *Superintendent and Inside Foreman,* W. D. Kelly, Rockwood.

This is a Class D drift mine, located 1,000 feet above sea level, in Cumberland Mountain, 1 mile from Oakdale, and connects with C. N. O. & T. P. Ry. Co. The Babahatchie seam, having an average thickness of 24 inches, is worked. The roof is sandstone and the bottom hard fire clay. It is developed on the entry and room or room and pillar system. Ventilation is produced by furnace with a grate area of 24 feet, and is distributed by the entry and airway system. Haulage is conducted from rooms to outside, a distance of 400 feet, by mules.

MORGAN COUNTY.

Baker No. 1 Mine—*Owner and Operator,* Baker Mining Co., Coalfield; *President,* J. N .Baker, Rockwood; *Secretary,* J. F. Baker, Rockwood; *Superintendent,* C. N. Baker, Coalfield; *Inside Foreman and Gas Boss,* Mack Taylor, Coalfield.

This is a Class C drift mine, located 1,000 feet above sea level, in Little Brushy Mountain, 2 miles from Coalfield, and connects with H. & N. E. and C. N. O. & T. P. Railroads. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom slate. It is developed on the single entry and air course system. Ventilation is produced by furnace with a grate area of 64 feet, and is distributed by cross cuts. Haulage is conducted from all workings to tipple, a distance of 400 feet, by mules.

MORGAN COUNTY.

Big Brushy No. 1-2 Mine—*Owner and Operator,* Big Brushy Coal & Coke Co., Petros; *President,* A. H. Wood, Petros; *Superintendent,* W. S. Wood, Petros; *Inside Foreman,* Sam Price, Petros.

This is a Class C drift mine, located 1,620 feet above sea level, in Big Brushy Mountain, ½ mile from Petros, and connects with H. & N. E. and C. N. O. and T. P.

Railroads. The Big Brushy seam, having an average thickness of 36 inches, is worked. The roof is sandstone and slate and the bottom fire clay. It is developed on the double entry sytem. Ventilation is produced by fan with a diameter of 5 feet, and is distributed as continuous current. Haulage is conducted in No. 1 entry from rooms to top of incline, a distance of 3,000 feet, by motors; and in No. 2 entry from rooms to top of incline, a distance of 4,000 feet, by motors; and from top of incline to tipple, a distance of 1,180 feet, by rope.

MORGAN COUNTY.

Big Mountain Mine—*Owner,* Poplar Creek Coal Mining Co., Oliver Springs; *Operator,* Big Mountain Coal Mining Co., Oliver Springs; *President,* Charles Livingston, Oliver Springs; *Secretary,* Marion Maxwell, Oliver Springs; *Superintendent,* Charles Livingston, Oliver Springs; *Inside Foreman,* Alexander Allen, Oliver Springs.

This is a Class A mine, located 2,000 feet above sea level, in Big Mountain, 4 miles from Oliver Springs, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry system. Ventilation is produced by furnace with a grate area of 56 feet, and is distributed by break throughs. Haulage is conducted from mine to tip, a distance of 1,800 feet, by mules.

MORGAN COUNTY.

Brushy Mountain No. 1 Mine—*Owner and Operator,* State of Tennessee, Nashville; *President,* T. S. Wilcox, G. M., Petros; *Superintendent,* A. W. Evans, Petros; *Inside Foreman,* John Boone, Petros.

Thsi is a Class B drift mine, located 1,620 feet above sea level, in Brushy Mountain, 1 mile from Petros, and connects with H. & N. E. and C. N. O. & T. P. railroads. The Brushy Mountain seam, having an average thickness of 32 inches, is worked. The roof is slate and the bottom fire clay and rash. It is developed on the double entry system. Ventilation is produced by fan, with a diameter of 16 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 1,000 feet, by mules; from sidetrack to tipple, a distance of 7,500 feet, by motors; and from tipple to railroad tipple, a distance of 700 feet, by gravity incline.

MORGAN COUNTY.

Brushy Mountain No. 3 Mine—*Owner and Operator,* State of Tennesee, Nahville; *President,* G. M. Wilcox, G. M., Petros; *Superintendent,* A. W. Evans, Petros; *Inside Foreman,* W. P. Rogers, Petros.

This is a Class B drift mine, located 1,620 fet above sea level, in Frozen Head Mountain, 1 mile from Petros, and connects with Harriman & N. E. and C. N. O. & T. P. Railroads. The Brushy Mountain seam, having an average thickness of 32 inches, is worked. The roof is slate and the bottom fire clay and rash. It is developed on the double entry, room and pillar system. Ventilation is produced by two fans with diameter of 7 and 9 feet, respectively, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 1,000 feet, by mules; from sidetrack to tipple, a distance of 6,000 feet, by motors; and from tipple to railroad tipple, a distance of 800 feet, by monitor cars.

MORGAN COUNTY.

Fagan Mine—*Owner and Operator,* J. A. Fagan, Blue Gem; *Superintendent and Inside Foreman,* J. A. Fagan, Blue Gem.

This is a Class D drift mine, located 800 feet above sea level, in Cumberland Mountain, 11 miles from Harriman, and connects with Harriman & N. E. Div. of Sou. Railroad. The Blue Gem seam, having an average thickness of 24 inches, is worked. The roof is blue slate and the bottom fire clay and sand rock. It is developed on the single entry, room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to pit mouth, a distance of 1,000 feet, by mules; and from pit mouth to tipple, a distance of 300 feet, by mules.

MORGAN COUNTY.

Fairchild Mine—*Operator and Superintendent,* W. G. Fairchild, Mill Creek.

This is a Class D drift mine, operated under lease, and located 1,185 feet above sea level, in Cumberland Mountain, 1½ miles from Huffman, and connects with C. N. O. & T. P. Ry. Co. The Glen Mary seam, having an average thickness of 18 inches, is worked. The roof is slate and the bottom clay. It is developed on the single entry

system. Ventilation is produced by furnace, with a grate area of 4 feet. Haulage is conducted from rooms to outside, a distance of 50 feet, by miners; and from outside to tipple, a distance of 60 feet, by miners.

MORGAN COUNTY.

Fritts Mine—*Owner,* E. A. Reed, Oliver Springs; *Operator, President, Superintendent and Inside Foreman,* J. W. Fritts, Oliver Springs.

This is a Class D drift mine, located 980 feet above sea level, in Cumberland Mountain, 1½ miles from Oliver Springs,. and connects with L. & N. and Southern Railroads. The Coal Creek seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by furnace, with a grate area of .. feet. Haulage is conducted from rooms to tipple, a distance of ..... feet, by mules.

MORGAN COUNTY.

Harriman Mine—*Operator,* Harriman Coal Co., Harriman; *President,* S. E. DeFreese, Chattanooga; *Superintendent,* E. F. Blizzard, Harriman, Rfd. 4.

This is a Class D drift mine, operated under lease, and located 1,100 feet above sea level, in Grassy Ridge Mountain, 8 miles from Harriman, and connects with H. & N. E. Railroad. The Jellico seam, having an average thickness of 31 inches, is worked. The roof is slate and sandstone and the bottom fire clay. It is developed on the single entry and room and pillar system. Ventilation is produced by furnace, with a grate area of 30 feet, and is distributed as continuous current. Haulage is conducted from mine to top of incline, a distance of 450 feet, by mules; from top of incline to bottom incline, a distance of 700 feet, by rope; and from bottom of incline to tipple, a distance of 5,000 feet, by mules.

MORGAN COUNTY.

Jackson Mine—*Operator,* Jackson Bros., Oliver Springs; *President,* Alex Jackson, Oliver Springs; *Secretary,* Alex Jackson, Oliver Springs; *Inside Foreman,* Thomas Jackson, Oliver Springs.

This is a Class C drift mine, operated under lease, and located 1,100 feet above sea level, in Cumberland Mountain, 2 miles from Oliver Springs, and connects with Southern Rallroad. The Coal Creek seam, having an average thickness of 40 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by furnace, with a grate area of 6 feet. Haulage is conducted from rooms to chute, a distance of 2,500 feet, by mules.

MORGAN COUNTY.

Little Brushy Mine—*Operator,* Little Brushy Coal Co., Coalfield; *Superintendent,* H. B. Bowling, Rec., Coalfield; *Inside Foreman,* W. F. Birchfield, Coalfield.

This is a Class C drift mine, operated under lease, and located 1,675 feet above sea level, in Brushy Mountain, 4 miles from Oliver Springs, and connects with Southern Railroad. The Jellico seam, having an average thicknesss of 36 inches, is worked. The roof is sandstone and the bottom sandstone. It is developed on the single entry and airway, room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to incline, a distance of 1,900 feet, by mules; and from incline to tipple at railroad, a distance of 1,780 feet, by rope.

MORGAN COUNTY.

Mount Carbon Mine—*Owner,* Mrs. W. C. Walker, Oliver Springs; *Operator,* Mount Carbon Coal Co., Oliver Springs; *President,* James Halburt, Oliver Springs; *Secretary,* A. B. Walls, Oliver Springs; *Superintendent,* R. P. Walls, Oliver Springs; *Inside Foreman,* J. J. Walls, Oliver Springs.

This is a Class B drift mine, located 1,400 feet above sea level, in Cumberland Mountain, 2 miles from Oliver Springs, and connects with Southern Railroad. The Mount Carbon seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom slate and fireclay. It is developed on the entry and rooms system. Ventilation is produced by furnace, with a grate area of 18 feet. Haulage is conducted from rooms to portal, a distance of 300 feet, by mules; and from mines to chute 1, a distance of 2,850 feet, by tram.

MORGAN COUNTY.

Oliver Mine—*Owner,* Richards Bros., Oliver Springs; *Operator,* Oliver Coal Co., Oliver Springs; *President,* W. D. Richards, Oliver Springs; *Superintendent,* John R. Richards, Oliver Springs; *Inside Foreman,* A. R. Walls, Oliver Springs.

This is a Class D drift mine, located 800 feet above sea level, in Cumberland Mountain, 3½ miles from Oliver Springs, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by furnace, with a grate area of 6 feet. Haulage is conducted from rooms to chute, a distance of 1,000 feet, by mules.

MORGAN COUNTY.

Poplar Creek Mine—*Owner,* Coal Creek Mining & Mfg. Co., Knoxville; *Operator,* Poplar Creek Coal Co., Oliver Springs; *President,* Thos. Pruden, Knoxville; *Secretary,* S. M. Leath, Clinton; *Inside foreman and Gas Boss,* W. W. Leach, Oliver Springs.

This is a Class A drift mine, located 1,150 feet above sea level, in Big Mountain Spur of Cumberland Mountain, 4 miles from Oliver Springs, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 44 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry and double room system. Ventilation is produced by fan, with a diameter of 16 feet, and is distributed as continuous current. Haulage is conducted from rooms to sidetrack, a distance of 600 feet, by mules; and from sidetrack to tipple, a distance of 1,300 feet, by rope.

MORGAN COUNTY.

Prudential No. 1 Mine—*Owner and Operator,* Prudential Coal Co., Oliver Springs; *President,* J. L. Boyd, Knoxville; *Secretary,* S. V. Carter, Knoxville; *Superintendent,* J. K. Butler, Oliver Springs; *Inside Foreman,* Bob Davis, Oliver Springs.

This is a Class A drift mine, located 1,000 feet above sea level, in Cumberland Mountain, 3½ miles from Oliver Springs, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom clay. It is developed on the single entry system. Ventilation is produced by furnace, with a grate area of 20 feet, and is distributed by the split system. Haulage is conducted from rooms to drum, a distance of 2,000 feet, by mules; and from drum to tipple, a distance of 2,000 feet, by rope incline.

MORGAN COUNTY.

Prudential No. 2 Mine—*Operator,* Prudential Coal Co., Oliver Springs; *President,* J. L. Boyd, Knoxville; *Secretary,* S. V. Carter, Knoxville; *Superintendent,* J. K. Butler, Oliver Springs; *Inside Foreman,* Bob Davis, Oliver Springs.

This is a Class B drift mine, operated under lease, and located 1,200 feet above sea level, in Brushy Mountain, 4 miles from Oliver Springs, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom stone. There is no defined system of work, as there are several openings. Ventilation is produced by furnace, with a grate area of .. feet. Haulage is conducted from rooms to knuckle, a distance of 300 feet, by mules; and from knuckle to railroad chute, a distance of 1,300 feet, by gravity.

MORGAN COUNTY.

Reed Mine—*Owner,* E. A. Reed, Oliver Springs; *Operator,* Oliver Springs Coal & Clay Co., Oliver Springs; *President,* Willis Whipple, Atlanta, Ga.; *Secretary and Superintendent,* H. B. Downing, Oliver Springs.

This is a Class C drift mine, located 950 feet above sea level, in Cumberland Mountain, 1 mile from Oliver Springs, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 32 inches, is worked. The roof is sandstone and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by furnace, with a grate area of 35 feet, and is distributed by the split system. Haulage is conducted from heading to mine entrance, a distance of 900 feet, by mules; and from mine entrance to railroad, a distance of 150 feet, by mules.

OVERTON COUNTY.

Brier Hill No. 1 Mine—*Owner and Operator,* The Brier Hill Collieries, Crawford; *President,* W. L. Wagner, New York City; *Secretary,* F. R. Russell, New York City; *Superintendent,* E. B. Taylor, Crawford; *Inside Foreman,* Julius Brown, Crawford.

This is a Class B drift mine, located 1,690 feet above sea level, in Cumberland Mountain, 2 miles from Crawford, and connects with Tennessee Central Railroad. The Bon Air seam, having an average thickness of 40 inches, is worked. The roof is shale and sandstone and the bottom fire clay. It is developed on the room and pillar system.

Ventilation is produced by fan, with a diameter of 12 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 1,700 feet, by mules, and from sidetrack to tipple, a distance of 2,100 feet, by motors.

OVERTON COUNTY.

Brier Hill No. 2 Mine—*Owner and Operator,* The Brier Hill Collieries, Crawford; *President,* W. L. Wagner, New York City; *Secretary,* F. R. Russell, New York City; *Superintendent,* E. B. Taylor, Crawford; *Inside Foreman,* Julius Brown, Crawford.

This is a Class B drift mine, located 1,690 feet above sea level, in Cumbrland Mountain, 2 miles from Crawford, and connects with Tennessee Central Railroad. The Bon Air seam, having an average thickness of 40 inches, is worked. The roof is shale and sandstone and the bottom fire clay. It is developed on the room and pillar system. Ventilation is produced by fan, with a diameter of 14 feet, and is distributed by the split system. Haulage is conducted from face to tipple, a distance of 3,700 feet, by motors.

OVERTON COUNTY.

Obey City No. 1 Mine—*Owner,* Obey River Coal Co., Nashville; *Operator,* Obey City Coal Co., Obey City; *President,* A. D. Eatherly, Obey City; *Secretary,* C. B. Eatherly, Obey City; *Superintendent and Inside Foreman,* A. D. Eatherly, Obey City.

This is a Class C drift mine, located 1,600 feet above sea level, in Cumberland Mountain, ½ mile from Obey City, and connects with Wilder Branch of Tennessee Central Railroad. The Bon Air No. 2 seam, having an average thickness of 34 inches, is worked. The roof is shale and the bottom shale and black jack. It is developed on the partly double entry and partly single entry system. Ventilation is produced by furnace with a grate area of 22 feet, and is distributed as continuous current. Haulage is conducted from coal face to outside track, a distance of 1,000 feet, by mules; and from outside track to tipple, a distance of 500 feet, by mules.

OVERTON COUNTY.

Overton Mine—*Owner and Operator,* Overton Coal & Coke Co., Davidson; *President,* W. R. Officer, Livingston; *Secretary,* A. E. Copeland, Davidson; *Superintendent,* A. G. Norrod, Davidson; *Inside Foreman,* D. P. Taylor, Davidson.

This is a Class D drift mine, located 1,668 feet above sea level, in Cumberland Mountain, 2½ miles from Davidson, and connects with Tennessee Central Railroad. The Bon Air No. 2 seam, having an average thickness of 60 inches, is worked. The roof is sandstone and the bottom sandstone. It is developed on the single entry and air course system. Ventilation is produced by furnace with a grate area of 20 feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of 460 feet, by mules; and from mine entrance to tipple, a distance of 140 feet, by mules.

OVERTON COUNTY.

Peacock Mine—*Owner,* Peacock Coal & Coke Co., Lebanon; *Operator,* J. C. Lusk, Obey City; *President,* J. T. Odum, Lebanon; *Superintendent and Inside Foreman,* J. C. Lusk, Obey City.

This is a Class B drift mine, located 1,750 feet above sea level, in Cumberland Mountain, at Obey City, and connects with T. C. Railroad. The Bon Air No. 2 seam, having an average thickness of 34 inches, is worked. The roof is slate and the bottom slate. It is developed on the single and double entry system. Ventilation is produced by furnace, with a grate area of 24 feet. Haulage is conducted from works to tipple, a distance of 1,000 feet, by mules.

RHEA COUNTY.

Fox No. 1 Mine—*Owner and Operator,* Durham Coal & Iron Co., Chattanooga; *President,* C. B. Eddy, Chattanooga; *Secretary,* Max Milligan, Chattanooga; *Superintendent,* Robt. Pettigrew, Chattanooga; *Inside Foreman,* S. P. Loggins, Graysville.

This is a Class A drift mine, located 950 feet above sea level, in Waldens Ridge, 3 miles from Graysville, and connects with C. N. O. & T. P. Ry. Co. The No. 2 seam, having an average thickness of 60 inches, is worked. The roof is slate shale and the bottom sand shale. It is developed on the room and pillar system. Ventilation is produced by fan with a diameter of 10 feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of 3,700 feet, by mules; from mine entrance to tipple, a distance of 2,000 feet, by locomotive; and from tipple to railroad, a distance of 11,000 feet, by locomotive.

RHEA COUNTY.

Fox No. 2 Mine—*Owner and Operator,* Durham Coal & Iron Co., Chattanooga; *President,* C. B. Eddy, Chattanooga; *Secretary,* Max Milligan, Chattanooga; *Superin-*

tendent, Robt. Pettigrew, Chattanooga; *Inside Foreman,* S. P. Loggins, Graysville.
This is a Class A drift mine, located 1,250 feet above sea level, in Waldens Ridge, 3½ miles from Graysville, and connects with C. N. O. & T. P. Ry. Co. The No. 5 seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom sand shale. It is developed on the single entry, room and pillar system. Ventilation is produced by fan with a diameter of 12 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 1,500 feet, by mules; from sidetrack to tip house, a distance of 4,000 feet, by rope; from tip house to second tipple, a distance of 4,000 feet, by locomotive; and from second tipple to railroad, a distance of 11,000 feet, by locomotive.

RHEA COUNTY.

Fox No. 3 Mine—*Owner and Operator,* Durham Coal & Iron Co., Chattanooga; *President,* C. B. Eddy, Chattanooga; *Secretary,* Max Milligan, Chattanooga; *Superintendent,* Robt. Pettigrew, Chattanooga; *Inside Foreman,* S. P. Loggins, Graysville.
This is a Class A drift mine, located 1,250 feet above sea level, in Waldens Ridge, 3½ miles from Graysville, and connects with C. N. O. & T. P. Ry. Co. The No. 5 seam, having an average thickness of 27 inches, is worked. The roof is slate and sandstone and the bottom sand shale. It is developed on the single entry, room and pillar system. Ventilation is produced by fan with a diameter of 10 feet, and is distributed as continuous current. Haulage is conducted from rooms to chute, a distance of 2,500 feet, by mules; from chute to tipple, a distance of 4,400 feet, by locomotive; and from second tipple to railroad, a distance of 11,000 feet, by locomotive.

RHEA COUNTY.

Penn Mine—*Owner and Operator,* Penn. Coal & Lumber Co., Spring City; *President,* John M. Reynolds, Bedford, Pa.; *Secretary,* A. I. Lyon, Bedford, Pa.; *Superintendent,* F. H. Enwright, Spring City; *Inside Foreman,* R. P. Simpson, Spring City.
This is a Class D drift mine, located 1,800 feet above sea level, in Waldens Ridge, 8 miles from Spring City, and connects with C. N. O. & T. P. Ry. Co. The ——— seam, having an average thickness of 36 inches, is worked. The roof is sandstone and the bottom fire clay.

RHEA COUNTY.

Prospect Mine—*Owner and Operator,* Dayton Coal & Iron Co. (Limited), Dayton; *Managing Director,* Peter Donaldson, Glasgow, Scotland; *Superintendent,* Nash Holden, Dayton *Inside Foreman,* J. C. Presnell, Dayton; *Gas Boss,* Nelson Rigsby, Dayton.
This is a Class A slope mine, located 840 feet above sea level, in Waldens Ridge, 2¼ miles from Dayton, and connects with C. N. O. & T. P. Ry. Co. The Nelson seam, having an average thickness of 32 inches is worked. The roof is sandrock and the bottom sandrock. It is developed on the room and entry system. Ventilation is produced by fan with a diameter of 18 feet, and is distributed as continuous current. Haulage is conducted from railroad tipple to mouth of slope, a distance of 600 feet, by rope; from slope mouth to slope sidetrack, a distance of 1,300 feet, by rope; from slope sidetrack to slope face, a distance of 750 feet, by mules; from slope to first left, a distance of 175 feet, by rope; from first left sidetrack to slope, a distance of 1,126 feet, by mules; from slope to second left sidetrack, a distance of 175 feet, by rope; from second left sidetrack to second left heading, a distance of 800 feet, by mules; and from slope to third left heading, a distance of 150 feet, by rope.

RHEA COUNTY.

Richland Mine—*Owner and Operator,* Dayton Coal & Iron Co. (Limited), Dayton; *Managing Director,* Peter Donaldson, Glasgow, Scotland; *Superintendent,* Nash Holden, Dayton; *Inside Foreman,* Clay Morgan, Dayton.
This is a Class B drift mine, located 985 feet above sea level, in Waldens Ridge, 2¾ miles from Dayton, and connects with C. N. O. & T. P. Ry. Co. The Richland seam, having an average thickness of 22 inches, is worked. The roof is slate and stone and the bottom slate and stone. It is developed on the single entry, room and pillar system. Ventilation is produced by fan with a diameter of 18 feet, and is distributed by the split system. Haulage is conducted from tipple to mine mouth, a distance of 2,000 feet, by rope; from mine mouth to C. District sidetrack, a distance of 600 feet, by rope; from C. District sidetrack to N. P. District sidetrack, a distance of 2,100 feet, by rope; from C. District sidetrack to C. entry heading, a distance of 2,860 feet, by mules; and from N. P. sidetrack to N. P. heading, a distance of 700 feet, by mules.

ROANE COUNTY.

McLean Mine—*Owner and Operator,* Roane Iron Co., Rockwood; *President,* H. S. Chamberlain, Chattanooga; *Superintendent,* J. M. Richards, Rockwood; *Inside Foreman,* W. T. Richards, Arbutus.

This is a Class C slope mine, located 1,580 feet above sea level, in Cumberland Mountain, 3 miles from Rockwood, and connects with Tennessee Central Railroad. The Sewanee seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by fan with a diameter of 10 feet, and is distributed as continuous current. Haulage is conducted from face to slope, a distance of 400 feet, by mules; and from slope to tipple, a distance of 1,200 feet, by rope.

ROANE COUNTY.

Old Mine—*Owner and Operator,* Roane Iron Co., Rockwood; *President,* H. S. Chamberlain, Chattanooga; *Superintendent,* W. J. Richards, Rockwood; *Inside Foremen,* W. T. Richards and W. S. Scarborough, Rockwood; *Gas Bosses,* W. C. Wright and James King, Rockwood.

This is a Class A slope mine, located 1,080 feet above sea level, in Cumberland Mountain, 1 mile from Rockwood, and connects with C. N. O. & T. P. Ry. Co. The Sewanee seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by fan with a diameter of 20 feet, and is distributed by the split system. Haulage is conducted from face to sidetrack, a distance of 5,000 feet, by mules; from sidetrack to slope, a distance of 5,500 feet, by gasoline engine; and from foot of slope to tipple, a distance of 5,000 feet, by rope.

ROANE COUNTY.

Treat Mine—*Owner,* Emory Gap Coal Co., Emory Gap; *Operator,* B. A. Treat, Trustee, Harriman; *Superintendent,* Wm. McDaniel, Emory Gap.

This is a Class D mine, located 1,500 feet feet above sea level, in Waldens Ridge, 1 mile from Emory Gap,, and connects with C. N. O. & T. P. Ry. Co. The Domestic seam, having an average thickness of 40 inches, is worked. The roof is slate and the bottom slate. It is developed on the room and pillar system. Ventilation is produced by furnace with a grate area of 48 feet. Haulage is conducted from heading to mouth, a distance of 700 feet, by rope; from mouth to monitor, a distance of 600 feet, by rope: and from monitor to tipple, a distance 3,700 feet, by gravity incline.

SCOTT COUNTY.

Baker Mine—*Owner,* New River Coal & Coke Co., New York City; *Operator,* Baker Coal & Coke Co., Newland; *President,* Sam P. Sparks, Harriman; *Secretary,* Van D. Sparks, Newland; *Superintendent,* A. McDonald, Harriman; *Inside Foreman,* John Hight, Newland.

This is a Class C drift mine, located 1,450 feet above sea level, in Arch Mountain, at Newland, and connects with Tennessee and C. N. O. & T. P. Railroads. The Dean seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom fire clay and shale. It is developed on the entry and air course, room and pillar system. Ventilation is produced by furnace with a grate area of 40 feet, and is distributed as continuous current. Haulage is conducted from working place to mouth of mine, a distance of 1,500 feet, by mules; from drift mouth to head of incline, a distance of 300 feet, by mules; and from head of incline to railway tipple, a distance of 1,600 feet, by gravity.

SCOTT COUNTY.

Coffee Mine—*Owner,* Paint Rock Coal Mining Co., Harriman; *Operator, President and Superintendent,* George Coffee, Laxton.

This is a Class C drift mine, located 1,250 feet above sea level, in Cumberland Mountain five miles from Oneida, and connects with Tennessee Railroad. The Paint Rock seam, having an average thickness of 28 inches, is worked. The roof is slate and the bottom stone. It is developed on the single entry system. Ventilation is produced by furnace with a grate area of 30 feet, and is distributed as continuous current. Haulage is conducted from rooms to tipple, a distance of 1,000 feet, by mules.

SCOTT COUNTY.

Glen Mary No. 2-4 Mine—*Owner and Operator,* Glen Mary Coal & Coke Co., Glen Mary; *President,* Gus Carter, Glen Mary; *Secretary,* J. P. Shaw, Lexington, Ky.; *Inside Foreman,* J. M. Carson, Glen Mary.

This is a Class C drift mine, located 1,470 feet above sea level, in Young Mountain, 2 miles from Glen Mary, and connects with C. N. O. & T. P. Ry. Co. The Glen Mary No. 4 seam, having an average thickness of 26 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the entry and airway course, room and pillar system. Ventilation is produced by furnace with a grate area of 45 feet, and is distributed as continuous current. Haulage is conducted from rooms to siding outside, a distance of 1,700 feet, by mules; and from siding to tipple, a distance of 10,000 feet, by dinkey engine.

SCOTT COUNTY.

Glen Mary No. 5 Mine—*Owner and Operator,* Glen Mary Coal & Coke Co., Glen Mary; *President,* Gus Carter, Glen Mary; *Secretary,* J. P. Shaw, Lexington, Ky.; *Inside Foreman,* J. M. Carson, Glen Mary.

This is a Class C drift mine, located 1,480 feet above sea level, in Diden Ridge, 3 miles from Glen Mary, and connects with C. N. O. & T. P. Ry. Co. The Glen Mary No. 4 seam, having an average thickness of 28 inches, is worked. The roof is slate and the bottom rock and fire clay. It is developed on the entry and air course, room and pillar system. Ventilation is produced by furnace with a grate area of 60 feet, and is distributed as continuous current. Haulage is conducted from rooms to siding outside, a distance of 2,150 feet, by mules; and from siding to tipple, a distance of 15,000 feet, by dinkey engine.

SCOTT COUNTY.

Lehigh No. 5 Mine—*Owner,* Ridgeway Sprankle Coal & Lumber Co., Philadelphia, Pa.; *Operator,* Scott County Coal Co., Helenwood; *Receiver,* B. A. Treat, Harriman; *Secretary,* M. W. Walker, Helenwood; *Inside Foreman,* J. C. Pemberton, Helenwood.

This is a Class C drift mine, located 1,700 feet above sea level, in Cumberland Mountain, ¾ mile from Helenwood, and connects with C. N. O. & T. P. Ry. Co. The No. 4 Glen Mary seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom rock. It is developed on the air course, single room and pillar system. Ventilation is produced by furnace with a grate area of 48 feet. Haulage is conducted from rooms to tipple, a distance of 2,700 feet, by mules.

SCOTT COUNTY.

Lehigh No. 6 Mine—*Owner,* Ridgeway Sprankle Coal & Lumber Co., Philadelphia, Pa.; *Operator,* Scott County Coal Co., Helenwood; *Receiver,* B. A. Treat, Harriman; *Secretary,* M. W. Walker, Helenwood; *Inside Foreman,* J. C. Pemberton, Helenwood.

This is a Class C drift mine, located 1,700 feet above sea level, in Cumberland Mountain, ½ mile from Helenwood, and connects with C. N. O. & T. P. Ry. Co. The No. 4 seam, having an average thickness of 39 inches, is worked. The roof is slate and the bottom rock. It is developed on the entry and air course, single room and pillar system. Ventilation is produced by furnace with a grate area of 36 feet. Haulage is conducted from rooms to tipple, a distance of 3,000 feet, by mules.

SCOTT COUNTY.

LeMoyne Mine—*Owner,* J. V. LeMoyne, Baltimore, Md.; *Superintendent,* J. C. Walker, Silerville, Ky.

This is a Class B drift mine, located 1,400 feet above sea level, in Cumberland Mt., 4½ miles from Isham, and connects with C. N. O. and T. P. Railway Co. The No. 4 seam, having an average thickness of 30 inches, is worked. The roof is slate and the botom shale. It is developed on the room and pillar system. Ventilation is produced by furnace with a grate area of 33 feet. Haulage is conducted from rooms to sidetrack, a distance of 360 feet, by mules; and from sidetrack to tipple, a distance of 910 feet, by mules.

SCOTT COUNTY.

Oneida Mine—*Owner and Operator,* Oneida Coal Co., Oneida; *President,* A. C. Terry, Oneida; *Secretary,* J. M. Terry, Oneida.

This is a Class C drift mine, located 1,450 feet above sea level, in Cumberland Mountain, four miles from Oneida, and connects with Tennessee and C. N. O. & T. P. Railroads. The Paint Rock seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the single entry system. Ventilation is produced by 2 furnaces with a grate area each of 48 feet. Haulage is conducted from rooms to portal, a distance of 800 feet, by mules; and from portal to tipple, a distance of 1,000 feet, by mules.

SCOTT COUNTY.

Paint Rock No. 1 Mine—*Owner,* Paint Rock Coal Co., Harriman; *Operator,* R. A. Woods & Co., Oneida; *Superintendent,* R. A. Woods, Oneida; *Inside Foreman,* James Buttram, Laxton.

This is a Class D slope mine, located 1,250 feet above sea level, in Cumberland Mountain, 4 miles from Oneida, and connects with C. N. O. & T. P. Ry. Co. The No. 5 seam, having an average thickness of 26 inches, is worked. The roof is rock and slate and the bottom rock. It is developed on the room and pillar system. Ventilation is produced by furnace with a grate area of 48 feet. Haulage is conducted from main to sidetrack, a distance of 800 feet, by mules; and from sidetrack to tipple, a distance of 3,000 feet, by mules.

SCOTT COUNTY.

Paint Rock No. 2 Mine—*Owner,* Paint Rock Coal Co., Harrisman; *Operator,* R. A. Woods & Co., Oneida; *Superintendent,* R. A. Woods, Oneida; *Inside Foreman,* James Buttram, Laxton.

This is a Class B drift mine, located 1,300 feet above sea level, in Cumberland Mountain, 1 mile from Almy, and connects with C. N. O. & T. P. Ry. Co. The No.5 seam, having an average thickness of 27 inches, is worked. The roof is slate and the bottom stone. It is developed on the entry and air course system. Ventilation is produced by furnace with a grate area of 48 feet. Haulage is conducted from rooms to sidetrack, a distance of 1,000 feet, by mules; and from sidetrack to tipple, a distance of 2,800 feet, by mules.

SCOTT COUNTY.

Paint Rock No. 3 Mine—*Owner,* Paint Rock Coal Co., Harriman; *Operator and Superintendent,* W. Phillips, Laxton; *Inside Foreman,* Dewey Jeffres, Laxton.

This is a Class C drift mine, located 1,400 feet above sea level, in Cumberland Mountain one-half mile from Almy, and connects with Tennessee Railroad. The No. 5 seam, having an average thickness of 28 inches, is worked. The roof is slate and the bottom slate and stone. It is developed on the single room and pillar system. Ventilation is produced by furnace with a grate area of 45 feet. Haulage is conducted from mines to tipple, a distance of 1,400 feet, by mules.

SCOTT COUNTY.

Phillips Mine—*Owner and Operator,* Virginia Mining Co., Roberta; *President,* L. E. Bryant, Roberta; *Secretary,* D. E. Bryant, Roberta; *Superintendent,* J. B. Craig, Roberta; *Inside Foreman,* Alfred Laxton, Roberta.

This is a Class D drift mine, located 1,400 feet above sea level, in Jellico Mountain, 4 miles from Oneida and Winfield, and connects with C. N. O. & T. P. Ry. Co. The ——— seam, having an average thickness of 38 inches, is worked. The roof is slate and the bottom clay and slate. It is developed on the room and pillar system. Ventilation is produced by fan with a diameter of 4 feet, and is distributed as continuous current. Haulage is conducted from rooms to tipple, a distance of —— feet, by motors.

SCOTT COUNTY.

Pine Knot Mine—*Owner,* Paint Rock Coal Co., Harriman; *Operator,* Pine Knot Coal Co., Laxton; *President,* D. Denny, Harriman; *Inside Foreman,* Jerry Connor, Laxton.

This is a Class B drift mine, located 1,340 feet above sea level, in Cumberland Mountain, five miles from Oneida, and connects with Tennessee Railroad. The Paint Rock seam, having an average thickness of 28 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the room and pillar system. Ventilation is produced by furnace with a grate area of 28 feet. Haulage is conducted from face coal to opening, a distance of 3,000 feet, by mules; and from opening to tipple, a distance of 900 feet, by mules.

SCOTT COUNTY.

Southern Clay Mine—*Owner and Operator,* Southern Clay Mfg. Co., Chattanooga; *President,* W. M. Lasley,Chattanooga; *Secretary,* W. C. Brown, Chattanooga; *Superintendent,* R. M. Ashby, Bobbins; *Inside Foreman,* J. C. Pemberton, Robbins.

This is a Class D drift mine, located 1,400 feet above sea level, in Cumberland Mountain, 1 mile from Robbins, and connects with C. N. O. & T. P. Ry. Co. The Glen Mary No. 4 seam, having an average thickness of 24 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the entry and air course, room and pillar system. Ventilation is produced by furnace with a grate area of 24 feet. Haulage is conducted from headings to mine mouth, a distance of 600 feet, by mules.

SCOTT COUNTY.

Stanley Mine—*Owner,* Paint Rock Coal Co., Harriman; *Operator,* Stanley Coal Co.,

Harriman; *Superintendent,* A. McDonald, Harriman; *Inside Foreman,* J. Elswick, Oneida, R. F. D. Fogal.

This is a Class B drift mine, located 1,300 feet above sea level, in Cumberland Mountain, five miles from Oneida, and connects with Tennessee Railroad. The Paint Rock seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the room and pillar system. Ventilation is produced by furnace with a grate area of 24 feet. Haulage is conducted from coal to mouth of mine, a distance of 1,400 feet, by mules; and from mouth of mine to tipple, a distance of —— feet, by mules.

SCOTT COUNTY.

West Hollow Mine—*Owner and Operator,* Virginia Mining Co., Roberta; *President,* L. E. Bryant, Roberta; *Secretary,* D. E. Bryant, Roberta; *Superintendent,* J. B. Craig, Roberta; *Inside Foreman,* John Phillips, Roberta.

This is a Class D drift mine, located 1,400 feet above sea level, in Jellico Mountain, 4 miles from Oneida and Winfield, and connects with C. N. O. & T. P. Ry. Co. The ———— seam, having an average thickness of 32 inches, is worked. The roof is slate and the bottom clay. It is developed on the room and pillar system. Ventilation is produced by fan with a diameter of 3 feet. Haulage is conducted from rooms to tipple, a distance of —— feet, by mules.

SCOTT COUNTY.

Workman Mine—*Owner,* Paint Rock Coal Co., Harriman; *Operator and Superintendent,* Dr. W. H. Workman, Meeks; *Inside Foreman,* J. C. Mahley, Laxton.

This is a Class D drift mine, located 1,300 feet above sea level, in Cumberland Mountain, one-half mile from Laxton, and connects with Tennessee and C. N. O. & T. P. Railroads. The No. 5 seam, having an average thickness of 23 inches, is worked. The roof is slate and the bottom stone. It is developed on the entry and air course system. Ventilation is produced by furnace with a grate area of 30 feet. Haulage is conducted from rooms to tipple, a distance of 300 feet, by mules.

SEQUATCHIE COUNTY.

Douglas No. 2 Mine—*Owner and Operator,* Southern Iron & Steel Co., Birmingham, Ala.; *Vice President,* B. F. Keiser, Brmingham, Ala.; *Secretary,* A. R. Forsyth, Birmingham, Ala.; *Superintendent,* John M. Smith, Dunlap; *Inside Foreman,* John Degnan, Dunlap.

This is a Class drift mine, located 1,667 feet above sea level, in Cumberland Mountain, 2 miles from Dunlap, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry and double room system. Ventilation is produced by fan with a diameter of 12 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 800 feet, by mules; from sidetrack to mine entrance, a distance of 5,000 feet, by tail rope; from mouth of mine to tipple, a distance of 3,900 feet, by locomotive; and from tipple to chute at railroad, a distance of 3,900 feet, by gravity drum.

WHITE COUNTY.

Bon Air (Shaft) Mine—*Owner and Operator,* Bon Air Coal & Iron Co., Nashville; *President,* John P. Williams, Nashville; *Secretary,* C. Cooper, Nashville; *Superintendent,* W. F. Dibrell, Bon Air; *Inside Foreman,* S. A. Rhinehart, Bon Air.

This is a Class C shaft mine, located 1,857 feet above sea level, in Cumberland Mountain, 1¼ miles from Bon Air, and connects with N., C. & St. L. Railway. The Bon Air seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry, room and pillar system. Ventilation is produced by fan with a diameter of 15 feet, and is distributed by the split system. Haulage is conducted from rooms to shaft landing, a distance of 700 feet, by motors.

WHITE COUNTY.

Bon Air No. 6 Mine—*Owner and Operator,* Bon Air Coal & Iron Co., Nashville; *President,* John P. Williams, Nashville; *Secretary,* C. Cooper, Nashville; *Superintendent,* W. F. Dibrell, Bon Air; *Inside Foreman,* William Morrow, Bon Air.

This is a Class C drift mine, located 1,646 feet above sea level, in Cumberland Mountain, ⅜ mile from Bon Air, and connects with N., C. & St. L. Railway. The Bon Air seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry, room and pillar

system. Ventilation is produced by fan with a diameter of 18 feet, and is distributed as continuous current. Haulage is conducted from rooms to sidetrack, a distance of 1,300 feet, by mules; from sidetrack to mine entrance, a distance of 3,400 feet, by tail rope; and from mine entrance to tipple, a distance of 400 feet, by running switch.

WHITE COUNTY.

Clifty Creek No. 1 Mine—*Owner and Operator,* Clifty Creek Coal Co., Clifty; *President,* R. R. Moody, Springfield, Mass.; *Secretary,* E. G. Rude, Springfield, Mass.; *Superintendent,* C. W. Bell, Clifty; *Inside Foreman,* Joe Ledford, Clifty.

This is a Class C drift mine, located 1,600 feet above sea level, in Cumberland Mountain, ¼ mile from Clifty, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 36 inches, is worked. The roof is sandrock and the bottom fire clay. It is developed on the double entry system. Ventilation is produced by furnace with a grate area of 50 feet, and is distributed by the split system. Haulage is conducted from headings to tipple, an average distance of 3,600 feet, by mules.

WHITE COUNTY.

Clifty Creek No. 3 Mine—*Owner and Operator,* Clifty Creek Coal Co., Clifty; *President,* R. R. Moody, Springfield, Mass.; *Secretary,* E. G. Rude, Springfield, Mass.; *Superintendent,* C. W. Bell, Clifty; *Inside Foreman,* Joe Ledford, Clifty.

This is a Class C drift mine, located 1,600 feet above sea level, in Cumberland Mountain, ¼ mile from Clifty, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 46 inches, is worked. The roof is shale and the bottom fire clay. It is developed on the double entry system. Ventilation is produced by furnace with a grate area of 50 feet, and is distributed by the split system. Haulage is conducted from headings to mine entrance, a distance of 1,800 feet, by mules; and from mine entrance to tipple, a distance of 600 feet, by mules.

WHITE COUNTY.

Eastland No. 1 Mine—*Owner and Operator,* Bon Air Coal & Iron Co., Nashville; *President,* John P. Williams, Nashville; *Secretary,* C. Cooper, Nashville; *Inside Foreman,* George Thom, Sr., Eastland.

This is a Class B drift mine, located 1,800 feet above sea level, in Cumberland Mountain, at Eastland, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by fan with a diameter of 18 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, an average distance of 1,425 feet, by mules; from first section east to mouth of pit, a distance of 3,000 feet, by mules; and from sidetrack to mouth of pit, a distance of 1,300 feet, by mules.

WHITE COUNTY.

Eastland No. 2 Mine—*Owner and Operator,* Bon Air Coal & Iron Co., Nashville; *President,* John P. Williams, Nashville; *Secretary,* C. Cooper, Nashville; *Inside Foreman,* George Thom, Sr., Eastland.

This is a Class B drift mine, located 1,800 feet above sea level, in Cumberland Mountain, at Eastland, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry, room and pillar system. Ventilation is produced by furnace with a grate area of 4½x5 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 700 feet, by mules; and from sidetrack to mouth of pit, a distance of 300 feet, by mules.

WHITE COUNTY.

Ravenscroft Mine—*Owner and Operator,* Bon Air Coal & Iron Co., Nashville; *President,* John P. Williams, Nashville; *Secretary,* C. Cooper, Nashville; *Superintendent,* W. D. Hardeman, Ravenscroft; *Inside Foreman,* James Cope, Ravenscroft.

This is a Class C shaft mine, located 1,800 feet above sea level, in Cumberland Mountain, at Ravenscroft, and connects with N., C. & St. L. Railway. The Ravenscroft seam, having an average thickness of 54 inches, is worked. The roof is sandstone and the bottom rash and fire clay. It is developed on the room and pillar system. Ventilation is produced by fan with a diameter of 10 feet, and is distributed by the split system. Haulage is conducted from works to sidetrack, an average distance of 1,250 feet, by mules; from sidetrack to cage, an average distance of 1,300 feet, by tail rope; and from bottom to top of tipple, a distance of 240 feet, by cage.

BARYTES

The following table shows total product and value of barytes produced in Tennessee in 1910, by counties, compared with 1909..

Barytes product and value in Tennessee in 1910, *compared with* 1909.

COUNTY	1910						1909		Increase + or Decrease —	
	Employes			Product			Product			
	Average Number	Av. Wages Paid Per Day	Total Wages Paid	Quantity (Short Tons)	Value	Value Per Ton	Quantity (Short Tons)	Value	Product (Short Tons)	Value
Loudon	6	------	------	1,000	$1,000	$ 1.00	400	$ 600	+ 600	+$ 400
McMinn	----	------	------	------	------	------	1,000	1,500	—1,000	— 1,500
Monroe	10	------	------	800	1,000	1.25	3,231	4,846	—2,431	— 3,846
Total	16	$1.10	$1,800	1,800	$2,000	$ 1.11	4,631	$ 6,946	—2,831	—$ 4,946

There are valuable deposits containing reserves in the counties of Cocke, Jefferson and Sevier which can be opened up when market conditions warrant it. The Payne-Aldrich tariff bill increased the duty on raw barytes from 75 cents to $1.50 per long ton, but it is claimed that it can still be brought from Germany and delivered in New York for $1.11 per ton less than it can from Tennessee. The production of barytes in the United States in 1909 amounted to 58,377 short tons, valued at $198,561 or $3.40 per ton.

IMPORTS.

The barytes and barium compounds imported and entered for consumption in the United States in 1910 are as follows:

	Quantity	Value
Manufactured barytes, sulphate of, including barytes earth (short tons)	3,184	$ 29,782
Unmanufactured barytes (short tons)	18,992	48,457
Total	22,176	$ 78,239
Barium Compounds:		Value
Binoxide of Barium, lbs	4,748,174	$ 341,631
Chloride of Barium, lbs	4,120,056	45,614
Blanc fixe or artificial Sulphate of barytes and satin white and artificial sulphate of lime, lbs	5,823,502	67,975
Total value		$ 533,459

CHARACTER AND USES.

Barytes, or heavy spar, is barium sulphate ($BaSO_4$), and is composed of barium minoxide 65.7 per cent, and sulphur trioxide 34.3 per cent. The specific gravity is 4.3 to 4.6 per cent, and the hardness 2.5 to 3.5 per cent. By nature, barytes is rarely pure, the most common impurities being lime, magnesia, silica and the oxides of iron and aluminum. One of the principal uses is as a pigment in mixed paints. It is not fitted for such use, however, until the extraction by milling of all associated minerals, such as clay, calcium, carbonate, silica, iron oxide, manganese oxide, lead and zinc. It is also used as a base for conveying many organic coloring matters used in paints. Other uses are in sugar refining, enameling, oil cloths and paper collars; in the manufacture of paper, cloth, rubber, lithophone, and in the manufacture of barium salts, and as an adulterant. The Tennessee product is practically all used for manufacturing purposes.

CEMENT

The following table shows the result of cement operations in Tennessee in 1910:

Average number of employes	460
Average wages paid per day	$ 1.52
Total amount paid for labor	$ 219,743
Total quantity Portland cement (bbls.)	770,000
Total value of product	$ 478,893
Yield of limestone in cement (per cent)	65
Coal used for fuel (short tons)	101,000
Clay or shale used (short tons)	13,334

The Dixie-Portland Cement Company, located at Richard City, in Marion County, with main office at South Pittsburg, was the only active plant in Tennessee in 1910. This plant has three kilns in use 8 x 110 feet each, and began operations November 1, 1907. The Clinchfield Portland Cement Corporation is constructing a plant at Kingsport, in Sullivan County, consisting of two kilns 8 x 125 feet each and capacitated to produce 1,000 barrels per day, which will begin operations about April 15, 1911.

UNITED STATES PRODUCTION.

The total quantity of Portland, natural and puzzolan cements produced in the United States in 1909 amounted to 64,196,386 barrels, valued at $51,232,979 or 80 cents per barrel. Of this amount 62,508,461 barrels, valued at $50,510,385, or 88 cents per barrel, was Portland cement; 1,527,279 barrels, valued at $623,141, was natural cement; and 160,646 barrels, valued at $99,453, was puzzolan or slag cement, which is made by mixing blast furnace slag with slaked lime.

PORTLAND CEMENT IN THE UNITED STATES BY STATES.

The following table gives the total Portland cement production in the United States by states in 1909:

Production of Portland cement in the United States in 1909, *by States.*

STATE	Producing Plants	Quantity (Barrels)	Value
Pennsylvania	21	20,923,606	$ 14,746,755
Indiana	6	7,026,081	5,331,468
Kansas	10	5,357,235	3,790,257
Illinois	5	4,241,392	3,388,667
New Jersey	3	4,046,322	2,813,162
Missouri	4	3,412,160	2,808,916
Michigan	12	3,212,653	2,620,089
California	5	4,017,923	5,666,921
Washington	2		
New York	7	2,087,884	1,838,462
Ohio	8	1,770,900	1,329,547
Iowa	1	1,253,814	1,102,258
Kentucky	1		
West Virginia	1		
Texas	3	1,461,281	1,584,651
Oklahoma	2		
South Dakota	1	1,013,875	1,033,864
Colorado	2		
Arizona	1	649,179	899,197
Utah	2		
Maryland	1	963,683	677,785
Virginia	1		
Massachusetts	1		
Alabama	1	1,070,473	878,386
Georgia	1		
Tennessee	1		
Total	103	62,508,461	$ 50,510,385

IMPORTS AND EXPORTS IN 1910.

The cement imported and entered for consumption in the United States in 1910 amounted to 116,925,839 pounds, valued at $396,428. The exports from the United States in 1910 amounted to 2,475,957 barrels, valued at $3,477,981.

RAW MATERIALS.

Portland cement is produced by burning a finely ground artificial mixture consisting essentially of lime silica, alumina and iron oxide, in certain definite proportions. Usually this combination is made by mixng lmestone or marl with clay or shale, in which case about three times as much of the lime carbonate should be present in the mixture as of the clayey materials. The burning takes place at a high temperature, approaching 3,000 degrees F., and must therefore be carried on in kilns of special design and lining. During the burning, combination of the lime with silica, alumina and iron oxide takes place. The product of the burning is a semi-fused mass called clinker, and consists of silicates, aluminates and ferrites of lime in certain definite proportions. This clinker must be finely ground. After such grinding the resulting powder is Portland cement. The finished product is blue to gray in color, has a specific gravity of 3 to 3.25, and when mixed with water will harden or set.

The product must be uniform in composition and quality; and as the processes of manufacture involve certain chemical as well as physical changes, four points may be regarded as of cardinal importance in making Portland cement. These are:

1. The cement mixture must be of the proper chemical and physical composition.
2. The raw materials of which it is composed must be finely ground, and intimately mixed before burning.
3. The burning must be conducted at the proper temperature.
4. After burning the resulting clinker must be finely ground.

A Portland-cement mixture, when ready for burning, will consist of about 75 per cent of lime carbonate ($CaCO_3$) and 20 per cent of silica (SiO_2), alumina (AL_2O_3) and iron oxide (Fe_2O_3) together, the remaining 5 per cent, including any magnesium corbonate, sulphur, and alkali that may be present.

VALUATION OF DEPOSITS OF CEMENT MATERIALS.

The value of a deposit of raw material for Portland cement manufacture depends upon a number of distinct factors, the more important of which are as follows:

1. Chemical composition of the material.
2. Physical character of the material.
3. Amount of material available.
4. Location of the deposit with respect to transportation routes.
5. Location of the deposit with relation to fuel supplies.
6. Location of the deposit with respect to markets.

The characteristics of a deposit necessary for the manufacture of a good Portland cement may be briefly stated as follows: The raw material must be of correct chemical composition for use as a cement material. This implies that the material, if a limestone, must contain as small a percentage as possible of magnesium carbonate. Under present conditions 5 or 6 per cent of magnesium carbonate is the maximum permissible. Free silica in the form of chert, flint or sand must be absent, or present only in small quantities, say 1 per cent or less. If the limestone is a clayey limestone or "cement rock," the proportion between its silica and its alumina and iron should fall within the limits.

$$\frac{SiO_2}{AL_2O_3+Fe_2O_3} > 2. \quad \text{and} \quad \frac{SiO_2}{AL_2O_3+Fe_2O_3} < 3.5$$

A clay or shale should satisfy the above equation, and should be free from sand, gravel, etc. Alkalies and sulphates should, if present, not exceed 3 per cent or so.

The nearer a limestone approaches in composition to the mixture used in Portland cement manufacture the greater its value for that purpose, for it will require the addition of less extraneous material to make the mixture absolutely correct in composition. The following are analyses of Portland cement mixtures, ready for burning, as used at various large cement plants in the United States:

Analysis of Portland cement mixtures (per cent).

	1	2	3	4
Silica (SiO_2)	12.85	12.92	13.52	14.94
Alumnia (AL_2O_3)	4.92	4.83	6.56	2.66
Iron oxide (Fe_2O_3)	1.21	1.77	-------	1.10
Lime Carbonate ($CaCO_3$)	76.36	75.53	75.13	75.59
Magnesium carbonate ($MgCO_3$)	2.13	4.34	4.32	4.64

It will be seen that the usual mixtures carry from 75 to 77 per cent of lime carbonate. If rock of this composition occurs in sufficient quantity it would require but little admixture of other materials to keep the cement correct in composition.

NEW USES FOR CEMENT.

White, non-staining Portland cement is now being manufactured for ornamental and surface work for both interior and exterior purposes. The material suitable for its manufacture must be selected with much care. Silica and alumina must be properly proportioned, and iron oxide must not be present in excess of 0.2 per cent in the finished product. Limestone and clay, low in iron oxide, are necessary in the manufacture of a colorless cement.

Cement is now being used on cornices to replace wood and metal on brick and stone structures, as well as on concrete houses. Handsome mantels, friezes and cornices are being successfully made of it, and separate pieces, such as statuary, urns, lamps, vases, pedestals, tables, seats, and other classes of sculptural and ornamental work can be produced.

A great deal of cement is used at present in paving, in concrete bases or foundations for granite block, brick, creosoted block and asphalt pavements. When protected from direct exposure, surfaced with another material, the concrete foundations give satisfaction. It is difficult however, to avoid contraction cracks, even when the pavement is divided into large blocks by means of joints. For this reason more satisfactory method of construction or treatment must be devised by which concrete can be used as a wearing surface for roads.

CLAY

The following table gives classified product of clay mined and sold in Tennessee in 1910.

Clay mined and sold in Tennessee in 1910 (*short tons*).

COUNTY	Total Number of Employes	Character of Clay Mined and Sold								Total
		Ball Clay	Fire Clay	Kaolin	Saggar Clay	Stoneware Clay	Wad Clay	Wood and Fiber Clay	Miscellaneous Clay	
Hardeman	4	------	------	------	------	1,000	------	------	------	1,000
Henry	218	33,091	------	------	3,375	------	10,529	------	6,997	53,992
James	5	------	------	------	------	------	------	612	------	612
Knox	3	------	------	340	------	------	------	------	------	340
Madison	5	------	225	------	------	------	------	------	------	225
Putnam	4	------	------	------	------	320	------	------	------	320
Rhea	25	------	1,402	------	------	3,199	------	------	------	4,601
Weakley	1	------	30	------	------	------	------	------	------	30
Total	265	33,091	1,657	340	3,375	4,519	10,529	612	6,997	61,120

RECAPITULATION

Total number of employes		265
Average wages paid per day	$	1.25
Total amount paid for labor	$	70,062

PRODUCT AND VALUES

CHARACTER OF CLAY	Product Short Tons		Value
Ball clay	33,091	$	84,305
Fire clay	1,657		2,923
Kaolin	340		395
Saggar clay	3,375		6,387
Stoneware clay	4,519		5,329
Wad clay	10,529		13,206
Wood and fiber clay	612		918
Miscellaneous clay	6,997		5,522
Total	61,120	$	118,985

The clay given above is only such as is mined and sold as clay by the miner, and does not embrace the clay turned into brick, tiling or pottery by the parties mining it, except as to stoneware values which are eliminated under head of brief statistics.

Tennessee has quite an extensive area of valuable clay deposits, practically covering the entire State. When burnt and prepared for the market all colors are represented, blue, buff, gray, red, terra cotta, white, etc. The most important and variegated clay deposits now under development are located in Henry County. The ball clay produced is shipped to Kentucky, Indiana, Missouri, New Jersey, New York, Ohio, Pennsylvania and West Virginia.

CLASSIFICATION OF TENNESSEE CLAYS—BY USES.

The Kaolin and ball clays are used in the manufacture of white tableware, sanitary ware, high grade tiling and electric porcelain. The refractory are the fire and plastic

clays used in the manufacture of fire brick, gas retorts, crucibles, etc. The pottery clay is used in the manufacture of stoneware, such as jugs, churns, jars, urns, jardinieres, pitchers, sewer pipe, etc.

The saggar clay is used for making saggars, in which the ware is burnt, and the wad clay is used for making wads, which are applied between the saggars, stacking them up in kilns. The slip clays are of low fusibility and are used to glaze clay wares.

CHEMICAL PROPERTIES OF CLAY.

The chemical elements composing the minerals in clay are: Oxygen, silicon, aluminum, iron, calcium, magnesium, sodium, hydrogen, titanium, potassium, carbon and sulphur. The last two elements may occur as simple elementary substances uncombined. The other elements are combined to form such compounds as lime, water and silica.

CHEMICAL COMPONENTS OF CLAY

Component	Chemical Symbol	Component	Chemical Symbol
Silica	SiO_2	Soda	Na_2O
Alumina	Al_2O_3	Titanic Acid	TiO_2
Ferric Oxide	Fe_2O_3	Sulphur Trioxide	SO_3
Lime	CaO	Carbon dioxide	CO_2
Magnesia	MgO	Water	H_2O
Potash	K_2O		

Iron, lime, magnesia, potash and soda are classed as fluxing impurities. In clay the lime is usually combined with carbon dioxide (CO_2), to form calcium carbonate ($CaCo_3$), or with water and sulphur trioxide to form hydrous sulphate of lime or gypsum.

The determination of the percentage of the different mineral compounds in the clay is called its rational analysis, which may be computed from the ultimate analysis, and is useful in making clay mixtures.

The analyses of clays submitted are all from Henry County. An analysis of one sample is as follows:

CHEMICAL ANALYSES.

Chemical Properties	Per Cent	Chemical Properties	Per Cent
Silica	48.94	Magnesia	0.71
Alumina	36.69	Potash	0.88
Oxide of iron	0.35	Soda	0.40
Lime	0.47	Loss on ignition	12.14
		Total	100.58

This analysis is close to that of Kaolin, of which the theoretical proportions are: Silica, 46.30 per cent; alumina, 39.90 per cent; water, 13.80 per cent.

Shrinkage in drying amounted to 8 per cent, does not crack or warp, and burns to a dense vitreous, practically non-absorbent, and exceedingly hard, strong body when carried up the temperature of its best vitrification.

Other analyses are as follows:

No. 1 Tenn. Ball Clay. Ultimate analysis.		No. 3 Tenn. Ball Clay. Ultimate Analysis.	
Chemical Properties.	Per Cent.	Chemical Properties.	Per Cent.
Volatile	13.94	Volatile	14.16
Silica	47.26	Silica	48.72
Alumina	35.85	Alumina	32.89
Iron Oxide	1.01	Iron Oxide	2.25
Calcium	0.58	Calcium	0.60
Magnesium	0.68	Magnesium	0.65
Potassium	0.74	Potassium	0.98
Sodium	0.45	Sodium	0.14
Rational Analysis.		**Rational Analysis.**	
Clay Substance	93.04	Clay Substance	89.04
Silica	6.17	Silica	9.64
Feldspar	0.79	Feldspar	1.32

The No. 1 clay soaks readily in water and will pass through a No. 12 lawn leaving but little residue. It is very plastic and will stand a great deal of handling, when moulded, its tensile strength being about the same as the English ball clay. It will carry 65 per cent of non-plastic material. When fired to cone 8 it shows a total shrinkage of 15 per cent, at which heat it burns to a clear dense body of excellent color.

The No. 3 clay soaks readily and on sifting through a No. 12 lawn leaves a residue of from 10 to 15 per cent, consisting mainly of fine grained sand. The sifting removes a great proportion of the iron found in the crude clay, it being in the form of iron pyrites. It is extremely plastic and will carry as high as 72 per cent of flint, and is nearly an exact counterpart of the English ball clays. When fired its shrinkage at cone 1, is 12.5 per cent, and at cone 8, 18 per cent, at which heat it burns to a dense, vitrified body of a grayish white color.

The following is the analysis of No. 7 Tennessee ball clay. Ultimate analysis:

Chemical Properties.	Per Cent.	Chemical Properties.	Per Cent.
Volatile	10.92	Potassium	.59
Silica	53.57	Sodium	.21
Alumina	32.82	(Rational Analysis.)	
Iron Oxide	1.31	Clay Substance	83.39
Calcium	.62	Silica	14.78
Magnesium	.38	Feldspar	1.83

This analysis was taken from an unwashed sample and determination of iron on the same clay after washing and sifting through a No. 12 lawn shows a considerable decrease in iron oxide, leaving a residue of less than 1 per cent. At cone 8 it burns to a dense and practically non-absorbent body, showing a shrinkage of 14 per cent.

This clay is being used extensively by white ware potters and tile manufacturers as a substitute for English ball clay.

The following is the analysis of wad and saggar clays:

MONROE WAD CLAY.

(Ultimate Analysis.)

Chemical Properties.	Per Cent.
Volatile	8.80
Silica	61.02
Alumina	26.32
Iron Oxide	1.58
Calcium	.69
Magnesium	.83
Potassium	.65
Sodium	.18
(Rational Analysis.)	
Clay Substance	49.67
Silica	45.79
Feldspar	4.54

SAGGAR CLAY.

(Ultimate Analysis.)

Chemical Properties.	Per Cent.
Volatile	8.38
Silica	63.54
Alumina	24.42
Iron Oxide	1.22
Calcium	.72
Magnesium	.63
Potassium	1.24
Sodium	.23
(Rational Analysis.)	
Clay Substance	62.94
Silica	34.36
Feldspar	2.70

CLAY PRODUCTS—BRICK, TILING, SEWER PIPE, Etc.

The following table gives number of employes, classified brick product by counties, and total value of all brick, flue goods, sewer pipe, tiling and other similar products in Tennessee in 1910:

Brick, tiling, sewer pipe and kindred products in Tennessee in 1910.

COUNTY	Total Number of Employes	QUANTITY (*Thousands*)					Total Value of all Brick, Drain Tile, etc.
		Common Brick	Vitrified Paving Brick	Front Brick	Fancy or Ornamental Brick	Fire Brick	
Bedford	5	300					$ 2,100
Blount	40	3,054		16			18,362
Carroll	22	1,500					7,500
Carter	16	1,000					5,500
Coffee	22	500			25		3,275
Davidson	242	26,147		7,569			206,615
Dekalb	10	150					900
Dyer	15	3,753					18,763
Gibson	41	2,159					13,761
Greene	29	229					8,369
Hamblen	12	800					5,600
Hamilton	330	23,913				700	282,649
Hardeman	25	1,000					7,000
Haywood	14	750					5,250
Henderson	4	100					750
Henry	20	1,000					7,000
Jefferson	6	130					975
Knox	152	23,939		616	2		148,703
Lawrence	7	230					1,275
Madison	65	2,478		249		710	27,885
Marshall	6	300					2,100
Maury	17	860					4,720
Montgomery	25	1,500					9,000
Obion	89	2,060					36,334
Putnam	2	50					400
Robertson	10	500					3,000
Rutherford	22	750					8,500
Scott	115		7,595				82,034
Sevier	8	75					600
Shelby	188	36,052					234,822
Sumner	4	200					1,400
Tipton	16	900					7,200
Warren	12	50					400
Washington	22	900					4,725
Weakley	20	2,400					12,000
White	11	300					3,000
Total	1,644	140,029	7,595	8,450	27	1,410	$1,182,467

RECAPITULATION.

Total average number of employes	1,644
Average wages paid per day	1.39
Total amount paid for labor	$498,222

CLASSIFIED QUANTITY AND VALUE OF PRODUCT.

CHARACTER OF PRODUCT	Quantity	Value	Value per 1,000
Common Brick	140,029,000	$ 813,836	$ 5.80
Vitrified paving brick	7,595,000	82,034	10.80
Front brick	8,450,000	78,320	9.27
Fancy or ornamental brick	27,000	351	13.00
Fire brick	1,410,000	17,607	12.48
Total	157,511,000	$ 992,148	$ 6.72
Drain tile		40,319	
Sewer pipe		140,000	
Hollow building tile and blocks		10,000	
Grand total value		$ 1,182,467	

POTTERY

The following table gives total average number of employes, and classified value of pottery products in Tennessee in 1910, by counties:

Employes and classified value of pottery products in Tennessee in 1910.

COUNTY	Total Average No. of Employes	Red Earthenware	Stoneware	Turpentine Cups	Total Value	Total Kilns in Use
Carroll	3	$ 200	$ 1,900		$ 2,100	
Davidson	35		40,017		40,017	
Hamilton	168			80,000	80,000	
Hardeman	7		3,000		3,000	
Madison	4	300	2,100		2,400	
Putnam	2		300		300	
Total	219	$ 500	$ 47,317	$ 80,000	$ 127,817	14

RECAPITULATION.

Total average number of employes	219
Average wages paid per day	1.40
Total amount paid for labor	$43,291

IMPORTS AND EXPORTS.

The following statement gives imports and exports of brick and other clay products in 1910.

KIND OF PRODUCT	Import Value	Export Value
Clay or earth	$ 1,933,559	$ 279,170
Brown Earthenware and Stoneware	1,181,332	928,475
China and Porcelain (decorated)	9,586,267	113,214
All other	551,927	
Total Pottery	$ 11,319,526	$ 1,041,689
Brick—(building), tile, etc	255,380	
Bricks (all other)		1,602,913
Grand total	$ 13,508,465	$ 2,923,772

COKE

The production of coke as used in this chapter is limited to that product obtained by the distillation or partial combustion of bituminous coal in retorts or ovens.

The beehive oven is exclusively used in Tennessee, the name being derived from the shape or design of the combustion chamber, which is similar to that of the conventional beehive. There are 16 coking establishments now in Tennessee, with a total of 2,715 ovens. Of the total number of ovens in existence during 1910, there were 1,449 idle during the entire year, leaving 1,266 active ovens, which produced 392,647 short tons of coke, or an average yield of 310 short tons per oven.

The coke-producing counties in 1910 were Campbell, Grundy, Hamilton, Marion, Morgan, Rhea, Roane and Sequatchie.

PRODUCTION.

The total coke output in Tennessee in 1910 amounted to 392,647 short tons, valued at $993,465, or $2.53 per ton. As compared with 1909 this is an increase in product of 129,897 short tons, or 49.43 per cent, and an increase in value of $323,918, or 48.40 per cent. As to rank of producing counties, Roane still leads with Rhea second and Morgan, third. Sequatchie captured fifth place from Marion.

CONDITION IN WHICH COAL IS CHARGED INTO THE OVENS.

There were 756,517 short tons of coal used in coke manufacture, and all but 41,650 short tons, or 5.50 per cent, was washed before being charged into the ovens. Of the 94.5 per cent of the coal washed before being charged into the ovens, 223,257 short tons, or 31.23 per cent, was washed run of mines, and 491,610 short tons, or 68,77 per cent, was washed slack. Of the total coal coked, 235,294 short tons, or 31.11 per cent, was run of mines, and 521,218 short tons, or 68.89 per cent, was slack. Crushing and washing the coal greatly facilitates the coking process and produces a much better quality of coke.

DISPOSITION OF PRODUCT.

The producing companies used 285,568 short tons in the manufacture of pig iron, at a valuation of $748,806, or $2.62 per ton, and sold 106,312 short tons for $224,419, or $2.11 per ton. The State of Tennessee produced 51,482 short tons at Brushy Mountain, which sold for $91,225, or $1.77 per ton. Eliminating the State operations. the coke sold amounted to 55,210 short tons, which brought $133,969, or $2.43 per ton. It will thus be observed that the commercial rate per ton, excluding the operations of the State at Brushy Mountain, was $2.43, while the rate received by the State was only $1.77 per ton.

The values for Rhea, Roane and Sequatchie Counties are based upon the reported cost of production, while the values for Campbell, Grundy, Hamilton, Marion and Morgan are based upon the commercial rate received per ton.

QUANTITY AND VALUE OF COAL USED IN COKE MANUFACTURE.

Excluding the operations of the State at Brushy Mountain mines in Morgan County, the quantity and value of coal used in coke manufacture are as follows:

Total Coal used in Coke Manufacture (short tons)	650,532
Total value of Coal used in Coke Manufacture	$ 753,713
Value per ton of Coal used	$ 1.16
Quantity of Coal used per ton of Coke product (short tons)	1.91
Total value of Coal in a ton of Coke	$ 2.21

COST OF COKE PRODUCT.

Excluding the operations of the State at Brushy Mountain, which constitute the figures for Morgan County, the cost of coke product manufactured in 1910 is as follows:

	Total Cost	Per cent of total cost
Coal Coked	$ 753,713	73.44
Labor	209,548	20.42
All other expenses	62,944	6.14
Total cost of Coke	$1,026,205	100.00

Calculating the cost on a tonnage basis, the cost of coke per ton is: coal $1.92; labor 0.53c; and other expenses, 0.16c, making a total cost of coke per ton of $2.61.

The reported cost per ton of coke at the State's plant at Brushy Mountain, not including the cost to maintain the laborers engaged in the work, which is not given, is as follows: coal $1.00, other expenses (estimated), 0.26c, making a total cost per ton of $1.26, exclusive of the cost per ton for labor.

ANALYSES.

The latest analysis given by the producing companies of coke manufactured in Tennessee are as follows:

Coke analyses in Tennessee, 1910.

COUNTY	Name of Works	Analysis (Per Cent)				
		Fixed Carbon	Volatile Matter	Ash	Moisture	Sulphur
Campbell	LaFollette	86.359	1.744	11.085	0.156	0.656
Grundy	Coalmont	85.75	0.39	13.44	0.39	0.61
Hamilton	Soddy	81.87	2.30	15.83		
Marion	Whitwell	86.09	0.71	12.46	0.74	0.84
Morgan	Brushy Mt.	87.90	0.194	10.16	0.20	1.55
Rhea	Nelson	83.06		14.70	1.30	0.63
Rhea	Richland	80.00	0.5	19.7		0.65
Rhea	Fox	84.04	0.57	15.14	0.25	0.80
Roane	Rockwood	82.93	3.28	12.57	0.8	0.34
Sequatchie	Southern	84.52	1.13	14.35		0.91
White	Eastland	82.10	1.06	14.16	0.32	2.36

COKE MAKING IN BY-PRODUCT OVENS.

The United States statistics show more activity in the construction of by-product recovery ovens during 1909 than for several years past. There were completed 140 additional Kopper's regenerative ovens at Joilet, Ill., and 50 United Otto ovens at Kokotto, near Cincinnati, Ohio; 50 United Otto ovens at Indianapolis, Ind.; and the beginning of a new construction of 560 Koppers at the Gary, Ind., plant of the United States Steel Corporation, which was completed in 1910; 40 Semet-Solvay ovens at South Chicago; 49 Semet-Solvay ovens at Cleveland, Ohio; and 300 Dieder ovens at Bethlehem, Penn. Beginning with 12 Semet-Solvay ovens at Syracuse, N. Y., in 1893, the initial year of construction, there were 3,989 by-product ovens built at the close of 1909, with 949 more in the course of construction. They consist of 2,104 United Otto, including the Otto-Hoffman and Schniewind types; 1,298 Semet-Solvay. 307 Rothberg; and 280 Koppers.

The entire coke product of Tennessee is still manufactured in the beehive oven, which in the near future must necessarily be superceded by the by-product oven, be-

cause it furnishes such an increased output per oven of coke, and produces a constant and steady increasing yield of coal in coke, as well as an appreciative increase in the prices per ton obtained for the manufactured product.

The average production from the by-product coke ovens in the United States in 1909 was 1,598 short tons of coke per oven, as compared with 1,142 short tons per oven in 1908, and 1,472 short tons per oven in 1907. The average production for each beehive oven in 1909 was 361 tons, against 258 short tons in 1908, and 386 tons in 1907. The yield of coal in coke at the by-product ovens in 1909 amounted to 74.5 per cent, as against 73.7 per cent in 1908. The yield of coal in coke in the beehive ovens in the United States in 1909 was 64.9 per cent, while in 1908 the yield was 64.7.

The excess in the yield of coal in coke, shown by the by-product oven as compared with the behive oven, is due to the exclusion of air in the the retort oven process while the coal is being distilled, and the fixed carbon remaining as coke, while in the beehive oven practice some of the fixed carbon is unavoidably burned.

It will be observed from tables 6 and 7 that the yield of coal in coke for the United States has increased from 63 per cent in 1880, to 66.2 per cent in 1909, and that the yield for Tennessee has decreased from 60 per cent in 1880, to 51.90 per cent in 1910. The increase in the average yield of coal in coke for the United States is due to the increase of coke manufactured in the by-product ovens.

In addition to the economy shown in the higher yield of coal in coke as well as in the higher prices obtained for the coke manufactured in the retort oven, the value of by-products obtained in its manufacture adds materially to the earning capacity of the plant. In 1909 the total value of coke made in by-product ovens was $20,434,689, while the value of the by-products amounted to $8,073,948 additional, as follows:

Gas (in cubic feet)	15,791,220 value	$2,609,211
Tar (gallons)	60,126,006 value	1,408,611
Ammonia sulphate or equivalent (lbs.)	123,111,197 value	3,227,316
Anhydrous ammonia (lbs.)	4,871,014 value	448,455
All other products		380,355
Total value of by-products		$8,073,948

The value of by-products in 1908 amounted to only $7,382,299.

The by-product gas is surplus gas not consumed in the coking process, and is either sold or used at the plant.

IMPORTS AND EXPORTS.

The coke imports in 1910 amounted to 156,417 short tons, valued at $625,919. The coke exports in 1910 amounted to 879,073 short tons, valued at $3,053,293.

The following series of six tables in reference to coke manufacture in Tennessee, and table No. 7 in reference to coke manufacture in the United States, will be found interesting:

TABLE No. 1—Shows operators of coke plants, arranged alphabetically by counties, also name of coke works in Tennessee in 1910.

Coke manufacturers and coke works in Tennessee in 1910.

	COKE MANUFACTURERS		COKE WORKS	
No.	COUNTY AND NAME	POSTOFFICE	COUNTY AND NAME	POSTOFFICE
	Campbell County.		*Campbell County.*	
1	LaFollette Coal, I. & R. R. Co	LaFollette	LaFollette	LaFollette.
	Claiborne County.		*Claiborne County.*	
2	Mingo Coal & Coke Co	Middlesboro, Ky	aMingo	Hartranft.
	Cumberland County.		*Cumberland County.*	
3	Waldensia Coal & Coke Co	Waldensia	aWaldensia	Waldensia.
	Grundy County.		*Grundy County.*	
4	Tenn. Con. Coal Co	Tracy City	aBryant Ridge	Tracy City.
5	Sewanee Fuel & Iron Co	Coalmont	Coalmont	Coalmont.
	Hamilton County.		*Hamilton County.*	
6	New Soddy Coal Co	Chattanooga	Soddy	Soddy.
	Marion County.		*Marion County.*	
7	New Etna Coal Co	Chattanooga	aEtna	Whitesides.
8	Tenn. Coal, I. & R. R. Co	Birmingham, Ala	Victoria	Victoria.
9	Tenn. Coal, I. & R. R. Co	Birmingham, Ala	Whitwell	Whitwell.
	Morgan County.		*Morgan County.*	
10	State of Tennessee	Nashville	Brushy Mountain	Petros.
	Rhea County.		*Rhea County.*	
11	Dayton Coal & Iron Co	Dayton	aNelson	Dayton.
12	Dayton Coal & Iron Co	Dayton	Richland	Dayton.
13	Fox Coal Co	Graysville	aFox	Graysville.
	Roane County.		*Roane County.*	
14	Roane Iron Co	Rockwood	Roane Iron	Rockwood.
	Sequatchie County.		*Sequatchie County.*	
15	Southern Steel Co	Birmingham, Ala	Southern	Dunlap.
	White County.		*White County.*	
16	Bon Air Coal & Iron Co	Nashville	aEastland	Eastland.

a—Not active.

TABLE No. 2—Shows number of coking establishments, number and character of coke ovens now built, number of ovens in process of building, number of ovens in blast during the year, and value of coke works in Tennessee in 1910.

Coke ovens and coke works in Tennessee in 1910.

COUNTY	Number of Establishments	OVENS			VALUE OF WORKS		
		Built	Building	In Blast During Year	Plant	Machinery and Improvements	TOTAL
Campbell	1	293		234	$ 165,000	$ 40,000	$ 205,000
Claiborne	1	173			25,000	3,000	28,000
Cumberland	1	60			10,000	5,000	15,000
Grundy	2	380		20	68,000	9,100	77,100
Hamilton	1	192		111	32,800	12,200	45,000
Marion	3	290		160	62,000	5,500	67,500
Morgan	1	140		134	22,543	5,000	27,543
Rhea	3	449		189	80,949	22,000	102,949
Roane	1	370		250	80,000	10,000	90,000
Sequatchie	1	168		168	15,000	5,000	20,000
White	1	200			120,000	5,000	125,000
Total	16	2,715		1,266	$ 681,292	$ 121,800	$ 803,092

Note—All ovens are of the bee-hive type.

TABLE No. 3—Shows number of employes, average wages paid per day, total wages paid, and character and quantity of coal coked by coke works in Tennessee in 1910.

Emplokes and wages and character of coal coked in Tennessee in 1910.

COUNTY	EMPLOYES			CHARACTER OF COAL COKED (Short Tons)				
	Total Number	Average Wages Paid Per Day	Total Amount Paid for Labor	RUN OF MINE		SLACK		TOTAL
				Unwashed	Washed	Unwashed	Washed	
Campbell	100						149,657	149,657
Claiborne								
Cumberland								
Grundy	20						29,880	29,880
Hamilton	45						68,853	68,853
Marion	46			12,042		29,608		41,650
Morgan	50						105,985	105,985
Rhea	65						137,235	137,235
Roane	120				175,264			175,264
Sequatchie	35				47,993			47,993
White								
Total	481	$ 1.25	$209,548	12,042	223,257	29,608	491,610	756,517

TABLE No. 4—Shows quantity of coal used in the manufacture of coke, yield of coal in coke (per cent), and value of coke produced at coke works in Tennessee in 1910.

Coal coked, yield of coal in coke and quantity and value of coke produced in Tennessee in 1910.

COUNTY	Coal Used (Short Tons)	Yield of Coal in Coke (Per Cent)	COKE PRODUCT		
			Quantity (Short Tons)	Value	Value Per Ton
Campbell	149,657	51.50	77,205	$ 131,249	$ 1.75
Claiborne					
Cumberland					
Grundy	29,880	53.77	16,077	44,212	2.75
Hamilton	68,853	55.20	37,992	91,180	2.40
Marion	41,650	60.25	25,097	72,729	2.90
Morgan	105,985	48.57	51,482	91,225	1.77
Rhea	137,235	51.70	70,986	233,840	3.29
Roane	175,264	50.00	87,632	250,000	2.86
Sequatchie	47,993	54.54	26,176	79,030	3.01
White					
Total	756,517	51.90	392,647	$ 993,465	$ 2.53

TABLE No. 5—Shows quantity and value of coal used in the manufacture of coke and quantity and value of coal per ton of coke at Tennessee coke works in 1910.

Quantity and value of coal used, and quantity and value of coal per ton of coke in 1910.

COUNTY	Coal Used (Short Tons)	Total Value of Coal Used	Value of Coal Per Ton	Quantity of Coal Per Ton of Coke	Value of Coal in a Ton of Coke
Campbell	149,657	$ 151,115	$ 1.01	1.94	$ 1.96
Claiborne					
Cumberland					
Grundy	29,880	29,880	1.00	1.85	1.85
Hamilton	68,853	61,967	0.90	1.81	1.63
Marion	41,650	47,610	1.15	1.66	1.91
Morgan	105,985	52,589	1.02	2.05	2.10
Rhea	137,235	191,305	1.39	1.93	2.68
Roane	175,264	205,103	1.17	2.00	2.34
Sequatchie	47,993	66,733	1.39	1.83	2.54
White					
Total	756,517	$ 806,302	$ 1.07	1.93	$ 2.06

TABLE No. 6—Shows the production and other coke statistics in Tennessee for the years 1880, 1890, 1900 and from 1901 to 1910, inclusive.

Consolidated statistics of coke manufacture in Tennessee, 1880-1910.

YEAR	Establishments	OVENS		Coal Used (Short Tons)	COKE PRODUCED			Yield of Coal in Coke (per cent.)
		Built	Building		Quantity (Short Tons)	Total Value of Coke at Ovens	Value per Ton	
1880	6	656	68	217,656	130,609	$ 316,607	$ 2.42	60.00
1890	11	1,664	292	600,387	348,728	684,116	1.96	58.00
1900	13	1,923	50	946,597	494,438	1,186,655	2.40	52.20
1901	13	1,914	190	741,267	393,197	892,351	2.27	53.00
1902	14	2,227	360	988,989	555,188	1,709,745	3.06	56.14
1903	15	2,421	260	1,013,531	547,109	1,693,292	3.09	53.98
1904	16	2,390	200	731,867	386,875	923,120	2.38	52.86
1905	16	2,604	------	871,590	468,799	1,184,555	2.52	53.78
1906	17	2,714	78	931,641	484,672	1,350,629	2.79	52.02
1907	17	2,819	------	896,411	453,729	1,408,303	3.10	50.61
1908	16	2,719	------	433,236	218,736	572,020	2.61	50.50
1909	16	2,700	15	507,359	262,750	669.547	2.55	51.78
1910	16	2,715	------	756,517	392,647	993,465	2.53	51.90

TABLE No. 7—Shows the production and other coke statistics in the United States for the years 1880, 1890, 1900, and from 1901 to 1909, inclusive.

Consolidated statistics of coke manufacture in the United States, 1880-1909.

YEAR	Establishments	OVENS		Coal Used (Short Tons)	COKE PRODUCED			Yield of Coal in Coke (per cent.)
		Built	Building		Quantity (Short Tons)	Total Value of Coke at Ovens	Value per Ton	
1880	186	12,372	1,159	5,237,741	3,338,300	$ 6,631,267	$1.99	63.00
1890	253	37,158	1,547	18,005,209	11,508,021	23,215,302	2,02	64.00
1900	396	58,484	5,804	32,113,553	20,533,348	47,443,331	2.31	63.90
1901	423	63,951	5,205	34,207,965	21,795,883	44,445,923	2,039	63.70
1902	456	69,069	8,758	39,604,007	25,401,730	63,339,167	2.49	64.10
1903	500	79,334	6,175	39,423,525	25,274,281	66,498,664	2.63	64.10
1904	507	83,599	4,430	36,531,608	23,661,106	46,144,941	1.95	64.80
1905	519	87,564	4,751	49,530,677	32,231,129	72,476,196	2.25	65.10
1906	532	93,901	4,519	55,746,374	36,401,217	91,608,034	2.52	65.30
1907	552	99,680	2,546	61,946,109	40,779,564	111,539,126	2.74	65.80
1908	551	101,218	2,241	39,440,837	26,033,518	62,483,983	2.40	66.00
1909	579	103,982	2,950	59,354,937	39,315,065	89,965,483	2.29	66.20

COPPER, GOLD AND SILVER

The Tennessee Copper Co., located at Copperhill, and the Ducktown Sulphur and Iron Co., Limited, located at Ducktown, and with home office in London, England, are the only producing copper companies in Tennessee.

The plants of both companies are located in Polk County, in what is known as the Ducktown Mineral District.

During 1910 the Tennessee Copper Co. operated the Burra Burra, Eureka, London and Polk County mines. The Ducktown Company operated the East Tennessee, Isabella and Mary mines. The results of these operations are as follows.

COPPER.

Total average number of employes	793
Average wages paid per day	$ 2.08
Total amount paid for labor	$ 467,035
Crude ore produced (short tons)	534,610
Value of product (crude ore)	$ 628,538
Value per ton (crude ore)	$ 1.18
Crude ore treated (short tons)	552,806
Refined copper produced (pounds)	16,837,727
Value of product (refined copper)	$2,061,500
Average value per pound refined copper (cents)	.12,738c
Yield per ton of crude ore in metal (pounds)	30.46
Yield of crude ore in refined copper (per cent)	1.52
Stock on hand beginning of year (pounds)	961,648
Stock on hand at end of year (pounds)	4,302,266
Sales, quantity of (pounds)	13,497,109
Sales, amount of	$1,655,972

GOLD.

Total product in fine ounces	306.11
Total value	$ ...6,122

SILVER.

Total product in fine ounces	111,588
Total value	$ ..56,875

SULPHURIC ACID.

Total product (short tons)	128,613
Total value	$ 668,693

The following table gives copper, gold and silver product in 1910, compared with 1909:

Production of copper, gold and silver in 1910, *compared with* 1909.

YEAR	Copper Ore Treated	Metal Content					
		Refined Copper		Gold		Silver	
	Quantity (Short tons)	Quantity (Pounds)	Value	Quantity (Fine Ounces)	Value	Quantity (Fine Ounces)	Value
1909	577,670	19,083,099	$ 2,389,984	281	$ 5,623	124,262	$ 62,347
1910	552,806	16,837,727	2,081,500	306	6,122	111,588	56,875
Increase + or decrease —	— 24,864	— 2,245,372	—$ 308,484	+ 25	+$ 499	—12,674	—$5,472

The following table shows copper operations in Tennessee from 1898, the first year of activity, to 1910, inclusive:

Copper statistics in Tennessee from 1898 to 1910, inclusive.

YEAR	Product and Value			Crude Ore Treated (Short Tons)	Refined Copper and Value			Yield of Crude Ore in Refined Copper (per cent)	Yield in Pounds of Metal for Each Ton of Crude Ore
	Quantity (Short Tons)	Value Crude Ore	Value Per Ton		Quantity (Pounds)	Value	Value Per Pound (Cents)		
1898	95,568	$205,471	$ 2.15	80,083	3,240,740	$ 356,481	.11	2.01	34.
1899	112,118	285,900	2.55	82,184	3,357,141	559,635	.1667	2.04	30.
1900	118,942	303,302	2.55	97,564	3,454,132	559,223	.1616	1.77	29.04
1901	267,830	669,575	2.50	162,461	5,732,048	908,914	.15857	1.71	21.40
1902	333,239	716,463	2.15	335,864	12,284,515	1,367,421	.11131	1.82	36.86
1903	319,873	719,714	2.25	370,278	13,668,389	1,809,011	.13235	1.84	42.76
1904	287,830	641,860	2.23	384,886	13,905,018	1,721,549	.1239	1.81	48.31
1905	384,192	864,432	2.25	399,330	14,541,425	2,219,938	.1526	1.87	37.85
1906	539,381	1,321,483	2.45	538,141	17,354,781	3,211,966	.185	1.61	32.20
1907	548,171	1,370,200	2.50	557,950	18,892,309	3,652,720	.193	1.72	33.86
1908	643,256	1,362,702	2.12	618,806	19,459,501	2,552,130	.131	1.57	31.45
1909	580,000	713,675	1.23	577,670	19,083,099	2,389,984	.12982	1.65	33.03
1910	534,610	628,538	1.18	552,806	16,837,727	2,081,500	.12738	1.52	30.46

The Ducktown district is the principal copper producing region in the Eastern United States, and from a productive standpoint in 1909 it was tenth in rank of the producing copper camps of the United States. Both plants connect with the Louisville & Nashville Railroad, and are in close reach of both coal and coke. The output of this district can be increased as desired, or market conditions warrant.

The plant of the Ducktown Company is equipped with a 500-ton smelter, which concentrates the ore into a matte, which is either sold on the market or shipped for converting into refined copper.

The Tennessee Copper Company plant has a 1,600-ton smelter and seven blast furnaces. The smelting process is in two stages. The first consists of a concentration of the ore to a low grade of matte, averaging about 15 per cent copper. This matte is cooled in beds on the slag dump and then broken up and hauled to the smelter bins. The second stage is a concentration of the first matte to matte of converting grade. This can be varied at will, the present practice being to produce a matte of about 32 per cent copper, which is easily handled in the converters.

The Ducktown copper district is located within easy reach of all the phosphate fields of the South, and owing to the fact that the sulphuric acid produced will enter into the manufacture of commercial fertilizers, which are mostly consumed in the South, it is reasonable to assume that the successful production of sulphuric acid will result in the establishment of an industry, which should in a degree lessen the cost of fertilizers, and in addition add materially to the mineral industry of Tennessee.

The sulphuric acid heretofore made in the United States has practically all been made from ore imported from Spain, and it can be readily seen that the saving of freight and expenses of handling will eventually be of great economic value to all consumers of fertilizers in the United States.

USES OF COPPER.

During 1909 there were 1,385,188,419 pounds of refined copper output cast. The percentage used for wire bars was 46, ingots and ingot bars 25, cakes 10, cathodes 16 and other forms 3.

IMPORTS AND EXPORTS.

The following table gives imports and exports of copper for the United States in 1910:

CHARACTER OF PRODUCT	Imports		Exports	
	Quantity (Pounds)	Value	Quantity (Pounds)	Value
Pigs, bars, ingots, plates and old	259,210,796	$ 31,620,689	695,107,043	$ 88,949,799
All other manufacturers of (duty)	----------	46,389	----------	5,132,287
Total not including ore	259,210,796	$ 31,667,078	695,107,043	94,082,086
Ore, Matte & regulus (free)	85,224,975	9,182,161	43,784	1,049,086
Grand total	344,435,771	$ 40,849,239	695,150,827	$ 95,131,172

COPPER PRODUCTION FOR THE UNITED STATES.

The following table gives the copper production in the United States in 1909 (in pounds) by the principal copper districts.

Blister copper production (in pounds) in the United States in 1909.

DISTRICT OR REGION	STATE	Approximate Smelter Output	Percentage of Total Production	Rank
Butte	Montana	314,000,000	28.73	1
Lake Superior	Michigan	227,000,000	20.77	2
Bisbee	Arizona	130,000,000	11.89	3
Bingham	Utah	86,000,000	7.87	4
Morenci-Metcalf	Arizona	72,000,000	6.59	5
Ely	Nevada	51,700,000	4.73	6
Shasta County	California	48,000,000	4.39	7
Jerome	Arizona	36,700,000	3.36	8
Globe	Arizona	33,000,000	3.02	9
Tennessee	Tennessee	19,200,000	1.76	10
Silver Bell	Arizona	10,500,000	.96	11
Coeur d'alene	Idaho	7,000,000	.64	12
Tintic	Utah	6,000,000	.55	13
Calaveras County	California	5,400,000	.49	14
Leadville	Colorado	5,200,000	.48	15
Lucin	Utah	4,500,000	.41	16
San Juan Ouray	Colorado	4,300,000	.39	17
Santa Rita	New Mexico	3,300,000	.30	18
Southeastern Alaska	Alaska	2,700,000	.25	19
Total	----------	1,066,500,000	97.58	------
All others	----------	26,400,000	2.42	------
Grand total	----------	1,092,900,000	100.00	------

WORLD'S PRODUCTION.

The smelter production of copper in the world in 1909 amounted to 1,875,584,624 pounds. The United States smelter production amounted to 1,092,951,624 pounds, or over 58.27 per cent of the total world's supply. During 1908 the United States only furnished 56.53 per cent of the world's supply, and in 1907, only 54.66 per cent of the total world's supply.

GAS, GAS COKE, TAR AND AMMONIA

The following table gives employes, coal carbonized, total quantity of gas produced in Tennessee in 1910, by counties, and quantity and percentage of gas sold and gas lost or unaccounted for:

Coal carbonized, gas produced, gas sold and gas lost or unaccounted for in 1910.

COUNTY	Total Number of Employes	Coal Carbonized (Short Tons)	Total Gas Production (Cubic Feet)	Gas Sold		Gas Lost or Unaccounted For	
				Quantity (Cubic Feet)	Percentage	Quantity (Cubic Feet)	Percentage
Davidson	100	b 29,332	298,858,500	265,355,180	88.80	33,503,320	11.20
Hamilton	75	16,069	167,904,200	145,022,800	86.32	22,881,400	13.68
Knox	83	b 16,445	149,890,000	128,970,500	86.04	20,919,500	13.76
Madison	25	3,405	32,667,000	32,667,000	100.00	----------	------
Montgomery	6	1,110	9,232,000	8,015,600	86.83	1,216,400	13.17
Rutherford	2	480	2,280,000	2,280,000	100.00	----------	------
Shelby	25	a	435,000,000	356,000,000	81.84	79,000,000	18.16
Sullivan	20	b 1,873	17,930,560	10,860,000	61.00	7,070,560	39.00
Total	336	68,714	1,113,762,260	949,171,080	85.22	164,591,180	14.78

a Oil and water gas exclusively. *b* Oil used also.

There is presented in the following table a classified statement showing the quantity and value of gas sold in Tennessee in 1910 for illuminating and fuel purposes, and price paid per 1,000 feet.

Gas produced and sold for illuminating and fuel purposes in Tennessee in 1910.

COUNTY	Gas Sold for Illuminating Purposes			Gas Sold for Fuel Purposes			Total Gas Sold		
	Quantity (Cubic Feet)	Value	Price Per 1,000 Cubic Feet	Quantity (Cubic Feet)	Value	Price Per 1,000 Cubic Feet	Quantity (Cubic Feet)	Value	Price Per 1,000 Cubic Feet
Davidson	159,213,108	$159,213	$ 1.00	106,142,072	$106,142	$ 1.00	265,355,180	$265,355	$ 1.00
Hamilton	87,013,680	86,143	.99	58,009,120	57,437	.99	145,022,800	143,580	.99
Knox	67,640,660	67,182	1.00	61,905,840	62,014	1.00	128,970,500	129,196	1.00
Madison	15,680,000	21,952	1.40	16,987,000	19,299	1.13	32,667,000	41,251	1.26
Montgomery	5,061,360	7,509	1.50	2,954,420	4,135	1.40	8,015,600	11,644	1.44
Rutherford	1,900,000	2,376	1.25	380,000	475	1.25	2,280,000	2,851	1.25
Shelby	120,000,000	120,000	1.00	236,000,000	236,000	1.00	356,000,000	356,000	1.00
Sullivan	4,860,000	4,860	1.00	6,000,000	6,000	1.00	10,860,000	10,860	1.00
Total	460,792,808	$469,235	$ 1.02	488,378,272	$491,502	$ 1.00	949,171,080	$960,737	$ 1.01

RECAPITULATION.

Total average number of employes	336
Average wages paid per day	$ 1.76
Total amount paid for labor	$177,907
Total population of all gas districts	389,395
Number of miles of mains	446
Number of gas meters in use	37,556
Number of gas stoves in use	34,789
Oil used (gallons)	2,088,565

General candle power ranges from 16 to 20. Lowest pressure for gas stoves ranges from 2 to 3.5 inches. The process ot manufacture for 4 plants is confined exclusively to coal, while there are 3 using both coal and Lowe, and one Lowe water gas exclusively. It is impossible to separate the coal gas from the oil and water gas.

CLASSIFIED PRODUCT AND VALUE.

Classified product and value of gas and by-products in 1910.

KIND OF PRODUCT	Quantity	Value
By-Products:		
Ammonia liquor (418,087 gallons) equivalent to anhydrous ammonia NH_3 (lbs)	162,641	$ 12,141
Coke (short tons)	32,503	97,713
Tar (gallons)	948,187	29,079
Total by-products		$ 138,933
Gas sold (cubic feet)	949,171,080	960,737
Grand total value		$ 1,099,670

UNITED STATES PRODUCTION.

The following table gives the production of gas, gas coke, tar and ammonia, and value thereof, at gas works, and by-product coke oven works; and in oil and water gas works in the United States in 1908. *b*

Gas, gas coke, tar and ammonia produced in the United States by all gas and by-product coke works in 1908.

KIND OF PRODUCT	Quantity	Value
Gas sold (cubic feet)	53,561,813,000	$ 37,227,901
Coke (short tons)	6,253,125	21,507,045
Tar (gallons)	101,261,829	2,537,118
Ammonia, reduced to NH_3 (lbs)	30,615,835	3,387,976
Ammonia sulphate (pounds)	44,093,437	
Total from coal gas and by-product coke works		$ 64,660,040
Oil and water gas works:		
Gas sold (cubic feet)	103,347,497	96,343,221
Tar sold (gallons)	*a* 9,168,834	229,582
Total from oil and water gas works		$ 96,572,803
Grand total from all gas and by-product coke works		$ 161,232,843

a 5,559,199 additional gallons reported to have been made but not sold.
b 1909 statistics not yet available.

IMPORTS OF COAL TAR PRODUCTS IN 1910.

The coal tar products imported and entered for consumption in the United States in 1910 are as follows:

KIND OF PRODUCT	Quantity	Value
Salicylic acid (lbs du) alizarine and colors or dyes	80,365	$ 12,594
Natural and artificial (lbs free)	2,746,414	537,512
Aniline Salts (lbs free)	5,709,398	501,369
Coal tar colors and dyes (du)		5,840,474
Coal tar products, not medicinal, not dyes, known as benzol, toluol, etc. (free)		962,934
Coal tar products, not medicinal, not dyes, known as benzol, toluol, etc. (du.)		578,808
Coal or Creosote Oil free, (gallons)		
Ammonium Sulphate (free)	42,608,386	2,331,884
Ammonium Sulphate (duty)	184,686,534	4,668,820
Total		$ 15,734,395

IRON ORE

Tennessee is divided into three iron ore districts. The Eastern district is composed of the counties of Blount, Carter, Cocke, Greene, Hancock, Johnson, McMinn, Monroe, Polk, Sevier, Sullivan, Unicoi and Washington. The Middle district is composed of the counties of Anderson, Bledsoe, Campbell, Claiborne, Hamilton, James, Marion, Meigs, Rhea, Roane, Sequatchie and Union. The Western district is composed of the counties of Benton, Davidson, Decatur, Dickson, Hardin, Hickman, Humphreys, Lawrence, Lewis, Montgomery, Perry, Stewart, Sumner and Wayne.

The following table shows total average number of employes, classified character and value of product, and explosives used in the operation of iron ore mines in Tennessee in 1910:

Iron ore operations in Tennessee in 1910.

COUNTY	Total Average Number of Employes	Character of Product (Long Tons)			Value of Product		Explosives Used	
		Brown Hematite	Red Hematite	Total	Total Value	Value Per Ton	Dynamite (Pounds)	Powder (Kegs)
	1	5	6	7	9	10	11	12
Campbell	54	--------	26,941	26,941	$ 40,411	$ 1.50	--------	--------
Claiborne	92	25,583	--------	25,583	34,618	1.35	5,000	--------
Dickson	10	2,433	--------	2,433	3,041	1.25	--------	--------
Hickman	165	59,281	--------	59,281	84,474	1.40	1,350	850
Johnson	125	6,867	--------	6,867	13,995	2.03	600	--------
Lawrence	315	221,794	--------	221,794	330,623	1.48	6,750	2,931
Lewis	44	30,388	--------	30,388	48,954	1.61	400	800
Meigs	75	--------	18,826	18,826	27,440	1.46	7,684	--------
Montgomery	25	1,922	--------	1,922	3,459	1.80	600	125
Roane	398	--------	198,938	198,938	248,066	1.24	39,200	8,000
Stewart	96	9,815	--------	9,815	9,390	0.96	--------	--------
Wayne	104	71,905	--------	71,905	143,810	2.00	6,950	2,396
Total	1,503	429,988	244,705	674,693	$988,281	$ 1.46	68,534	15,102

RECAPITULATION

Total average number of employes	1,503
Average wages paid per day	$ 1.70
Total amount paid for labor	$ 524,667

Lawrence County has captured first position in rank from Roane. Wayne is third and Hickman fourth, Lewis fifth and Campbell sixth.

The total value of brown hematite ore amounted to $672,364, or $1.56 per ton. The total value of the red hematite ore amounted to $315,917, or $1.29 per ton.

As compared with 1909, this is an increase in product of 25,868 long tons, or 4 per cent, and an increase in value of $52.318, or 5.6 per cent.

There were 602,297 long tons of ore consumed by the producers or subsidiary companies in the manufacture of pig iron, at a valuation of $890,829, or $1.48 per ton, and 64,401 long tons sold for $92,000, or $1.43 per ton.

The deposits in the counties of Claiborne, Cocke, Dickson, Hickman, Johnson, Lawrence, Lewis, Montgomery, Stewart, Unicoi, Washington and Wayne occur in pockets. The deposits in the remaining counties, under present development, occur in regular ore seams or veins.

For the percentage of metallic iron contained in the ore product, reference is directed to the statistics on pig iron manufacture immediately following the statistics of iron ore.

The following table shows product and value of iron ore produced in Tennessee in 1910, by counties, compared with 1909, showing increases and decreases:

Product and value of iron ore in Tennessee in 1910, *compared with* 1909.

COUNTY	1910		1909		Increase + or decrease −	
	Product (Long Tons)	Value	Product (Long Tons)	Value	Product (Long Tons)	Value
Campbell	26,941	$ 40,411	-------	-------	+26,941	+$ 40,411
Claiborne	25,583	34,618	9,560	$ 14,758	+16,023	+ 19,860
Dickson	2,433	3,041	-------	-------	+ 2,433	+ 3,041
Hickman	59,281	84,474	39,365	60,479	+19,916	+ 23,995
Johnson	6,867	13,995	47,602	72,324	−40,735	− 58,329
Lawrence	221,794	330,623	159,717	246,225	+62,077	+ 84,398
Lewis	30,388	48,954	20,587	27,772	+ 9,801	+ 21,182
Meigs	18,826	27,440	26,253	41,907	− 7,427	− 14,467
Monroe	-------	-------	2,490	3,350	− 2,490	− 3,350
Montgomery	1,922	3,459	5,704	10,267	− 3,782	− 6,808
Roane	198,938	248,066	259,754	319,949	−60,816	− 71,883
Stewart	9,815	9,390	11,829	10,945	− 2,014	− 1,555
Unicoi	-------	-------	5,250	7,875	− 5,250	− 7,875
Washington	-------	-------	2,632	3,948	− 2,632	− 3,948
Wayne	71,905	143,810	58,082	116,164	+13,823	+ 27,646
Total	674,693	$ 988,281	648,825	$935,963	+25,868	+$ 52,318

The following table shows product and value of iron ore in Tennessee from 1892 to 1910, inclusive:

Product and value of iron ore in Tennessee, 1892 *to* 1910, *inclusive.*

YEAR	Product (Long Tons)	Value	Value Per Ton	YEAR	Product (Long Tons)	Value	Value Per Ton
1892	406,578	------	------	1901	620,458	----------	------
1893	372,996	------	------	1902	628,870	$ 754,644	$ 1.20
1894	292,831	------	------	1903	724,264	878,909	1.21
1895	519,796	------	------	1904	539,820	613,705	1.14
1896	535,484	------	------	1905	730,981	962,427	1.32
1897	604,497	------	------	1906	879,059	1,252,853	1.42
1898	617,579	------	------	1907	817,767	1,306,727	1.60
1899	667,149	------	------	1908	588,988	808,676	1.37
1900	699,724	------	------	1909	648,825	935,963	1.44
				1910	674,693	988,281	1.46

IRON ORE PRODUCTION IN THE UNITED STATES.

The iron ore product of the United States in 1909 amounted to 51,294,271 long tons, four-fifths of which were furnished by Michigan and Minnesota, with Minnesota first in rank, furnishing 28,975,149 long tons. Tennessee is now ninth in rank.

IMPORTS AND EXPORTS IN 1910.

The imports of iron ore entered for consumption in the United States in 1910 amounted to 2,591,031 long tons, valued at $7,832,225. The exports of iron ore amounted to 644,875 long tons, valued at $2,074,164.

IRON (PIG)

The following table gives name and postoffice address of all pig iron manufacturers and furnaces in Tennessee in 1910:

Pig iron manufacturers and furnaces in Tennessee in 1910.

MANUFACTURERS			FURNACE		
No.	County and Name	Postoffice	No.	County and Name	Location
	Campbell County			*Campbell County*	
1	LaFollette C., I. & Ry. Co	LaFollette	1	a LaFollette	LaFollette.
	Dickson County			*Dickson County*	
2	Warner Iron Co	Nashville	2	Cumberland	Cumb. Furnace.
	Hamilton County			*Hamilton County*	
3	Citico Furnace Co	Chattanooga	3	Citico	Chattanooga.
4	Southern Steel Co	Birmingham, Ala.	4	Southern	Chattanooga.
	Hickman County			*Hickman County*	
5	Bon Air Coal & Iron Co	Nashville	5	a Warner	Warner.
6	Napier Iron Works	Nashville	6	a Aetna	Aetna.
7	Standard Iron Co	Nashville	7	Standard	Goodrich.
	Lewis County			*Lewis County*	
8	Napier Iron Works	Nashville	8	Napier	Napier.
	Marion County			*Marion County*	
9	Tenn. Coal, I. & R. R. Co	Birmingham, Ala.	9	a South Pittsburg 1	South Pittsburg
	Tenn. Coal, I. & R. R. Co	Birmingham, Ala.	10	a South Pittsburg 2	South Pittsburg
	Tenn. Coal, I. & R. R. Co	Birmingham, Ala.	11	a South Pittsburg 3	South Pittsburg
	Maury County			*Maury County*	
10	Rockdale Iron Co	Rockdale	12	Rockdale	Rockdale.
	Montgomery County			*Montgomery*	
11	Red River Furnace Co	Clarksville	13	Red River	Clarksville
	Rhea County			*Rhea County*	
12	Dayton Coal & Iron Co	Dayton	14	Dayton (1)	Dayton.
	Dayton Coal & Iron Co	Dayton	15	Dayton (2)	Dayton.
	Roane County			*Roane County*	
13	Roane Iron Co	Rockwood	16	Rockwood (1)	Rockwood.
	Roane Iron Co	Rockwood	17	Rockwood (2)	Rockwood.
	Roane Iron Co	Rockwood	18	Rockwood (3)	Rockwood.
	Stewart County			*Stewart County*	
14	Dover Furnace Co	Carlisle	19	ab Bear Spring	Bear Spring.
	Dover Furnace Co	Carlisle	20	b Dover	Carlisle.
	Washington County			*Washington County*	
15	Cranberry Furnace Co	Cranberry, N. C.	21	Cranberry	Johnson City.
16	Embree Iron Co	Embreeville	22	a Embree	Embreeville.
	Wayne County			*Wayne County*	
17	Bon Air Coal & Iron Co	Nashville	23	Mannie (1)	Allen's Creek.
	Bon Air Coal & Iron Co	Nashville	24	Mannie (2)	Allen's Creek.

(a)—Not active. (b)—Cold blast, charcoal furnace.

The iron ore necessary to operate these furnaces is obtained from the country surrounding or adjacent to the location of the furnaces, and by examining the percentage of yield of ore in pig iron, comparative value of the ore produced can be determined.

The following table shows average number of employes, average number of days active, quantity of iron ore treated, percentage of yield of ore in iron, and quantity of pig iron produced in Tennessee in 1910:

Pig iron employes, ore treated, and pig iron product in Tennessee in 1910.

COUNTY	Average Number of Employes	Average Number of Days Active	Iron Ore Treated (long tons)	Pig Iron Produced (long tons)	Yield of Ore in Iron (Per Cent)
Campbell	154	308	121,288	44,874	37.00
Dickson	70	344	54,328	24,233	44.60
Hamilton	248	220	185,925	67,664	36.40
Hickman	60	365	47,978	24,679	51.41
Lewis	90	285	52,067	24,353	46.83
Maury	38	191	7,133	3,471	48.66
Montgomery	90	206	33,617	18,934	56.31
Rhea	180	361	126,594	51,248	40.50
Roane	170	365	186,575	74,059	40.00
Stewart	29	329	6,632	3,528	53.20
Washington	77	365	63.736	29,344	46.07
Wayne	77	365	63,582	31,103	48.91
Total	1,283	294	949,455	397,490	41.84

RECAPITULATION.

Total average number of employes	1,283
Average wages paid per day	$ 1.49
Total amount paid for labor	$ 563,186
Total product (long tons)	397,490
Total value of product	$5,206,293
Average value per ton of product	$ 13.15
Stock on hand beginning of year (long tons)	31,138
Stock on hand end of year (long tons)	32,652

As compared with 1909, pig iron product shows an increase of 66,879 long tons, or 20.23 per cent, and an increase in value of $732,554, or 16.40 per cent. There was a decrease in the average value per ton of 38 cents.

MATERIAL USED IN THE MANUFACTURE OF PIG IRON.

Iron ore (long tons)	949,455
Coke (short tons)	681,639
Limestone flux (short tons)	240,144
Mill cinders (long tons)	10,416
Phosphate (long tons)	5,079
Sand (long tons)	1,324
Charcoal (bushels)	591,320

Eliminating the charcoal furnace and phosphate operations, it required an average of 3,436 pounds of coke, an average of 5,367 pounds of iron ore and an average of 1,220 pounds of limestone for fluxing to make one ton of pig iron.

The average percentage of cost that each ingredient entering into pig iron manufacture bears to the total average cost of pig iron (including amount paid for freight) is: labor, 12.56 per cent; iron ore, 37.52 per cent; coke, 46.37 per cent; stone for fluxing, 3.55 per cent.

The following table gives classified value and product of pig iron produced in Tennessee in 1910:

Classified product and value of pig iron in Tennessee in 1910.

Character of Product	Amount of Product (long tons)	Value of Product	Value per ton of Product
Cold blast	3,528	$ 112,400	$ 32.00
Ferro Phosphorus	3,471	154,459	44.50
No. 1. soft	21,192	262,494	12.38
No. 2. soft	52,503	672,590	12.81
No. 1. Foundry	379	4,548	12.00
No. 2. Foundry	100,915	1,213,304	12.00
No. 3. Foundry	38,268	445,084	11.63
No. 4. Foundry	45,884	517,413	11.27
Gray Forge	12,327	137,394	11.15
Over .05 Sulphur	9,003	113,357	12.60
Under .05 Sulphur	88,319	1,260,287	14.27
Furnace Scrap	86	956	11.00
Mottled White	2,500	25,463	10.20
Silicon	19,115	286,544	14.99
Total	397,490	$5 206,293	$ 13.15

IRON AND STEEL INDUSTRY OF THE UNITED STATES.

During 1909 there were twenty-four States producing pig iron, contributing a total tonnage of 25,795,471 long tons, as against 15,936,018 long tons in 1908. Tennessee was eighth in rank of producing States. The production by kinds in long tons is as follows:

Bessemer and low phosphorus	10,557,370
Basic (mineral fuel)	8,250,225
Forge pig iron	725,624
Foundry and ferro silicon	5,322,415
Malleable Bessemer	658,048
Spiegeleisen	142,831
Ferromanganese	82,209
White Mottled, direct castings, etc.	56,749
Total	25,795,471

The total production of Bessemer steel ingots and castings in 1909 amounted to 9,330,783 long tons. The open hearth steel amounted to 14,493,936 long tons. The crucible steel amounted to 107,355 long tons, which, with other steel product of 22,947 long tons, aggregate 23,955,021 long tons as the total steel product in 1909, as compared with 14,023,247 long tons in 1908.

IMPORTS AND EXPORTS.

The pig iron imported and entered for consumption in the United States in 1910 amounted to 237,233 long tons valued at $6,549,938. The exports of pig iron in 1910 amounted to 127,385 long tons, valued at $2,113,036.

ELECTRIC SMELTING.

The electric smelting plant of the Electro-Metall Company, of Ludvika, Sweden, for the purpose of smelting iron and making steel by electricity, is said to be a success. It is also thought that further and important innovations along this line will soon be made in the United States.

LIME

The following table gives number of employes and total quantity and value of lime by works reported active in Tennessee in 1910:

Lime product and other statistics in Tennessee in 1910.

COUNTY	Total Number of Employes	Quantity of Lime Burned (S. Tons)	Value of Lime Burned	Value of Lime Per Ton
Coffee	18	6,521	$ 21,284	$ 3.26
Cumberland	40	3,200	8,000	2.50
Dickson	40	8,000	24,000	3.00
Franklin	40	20,000	60,000	3.00
Houston	75	16,500	52,000	3.15
James	30	2,684	9,695	3.61
Knox	56	16,807	48,131	2.86
Lawrence	6	74	370	5.00
Maury	5	80	400	5.00
Rhea	49	4,860	17,200	3.54
Union	36	5,616	16,793	2.99
Total	389	84,342	$ 257,873	$ 3.05

RECAPITULATION

Total average number of employes	389
Average wages paid per day	$ 1.30
Total amount paid for labor	$ 112,329
Total quantity of stone burned (short tons)	124,317
Total value of stone burned	$ 65,150
Estimated cost of fuel	$ 63,000

USES OF LIME PRODUCT.

The following table gives lime production in Tennessee in 1910, classified according to uses:

Lime production in Tennessee in 1910, *classified by uses.*

USE	Quantity (S. Tons)	Value	Value Per Ton
Building	41,395	$ 130,247	$ 3.15
Dealers (uses not specified)	4,866	14,553	3.00
Fertilizers	79	100	1.27
Hydrated	4,057	14,209	3.50
Paper Mills, Sulphate and Soda pulp Works	19,890	56,687	2.85
Sugar factories	3,000	9,000	3.00
Tanneries	1,033	3,000	2.90
Chemical works	10,000	30,000	3.00
Other purposes	22	77	3.50
Total	84,342	$ 257,873	$ 3.05

FUELS USED IN BURNING LIME

Coal (short tons)	17,272	Lime product (short tons)	42,503
Wood (cords)	9,158	Lime product (short tons)	19,574
Coal (short tons) and wood (cords)	4,650 and 6,425	Lime product (short tons)	22,265
		Total	84,342

IMPORTS AND EXPORTS.

The imports of lime entered for consumption into the United States in 1910 amounted to 6,498 short tons, valued at $63,793. The exports of lime amounted to 16,160 short tons, valued at $127,952.

MANGANESE

The manganese ores of Tennessee occur near the eastern border of the Appalachian Valley deposits. The only deposits now known occur in Cocke County, near Newport and Del Rio, and near Shady Valley, in Johnson County.

The ore is both soft and hard, the soft ore occurring in pockets and seams associated with clays, and the latter in irregular masses scattered through the clay and soft ore pockets.

The mines were all idle during 1910 on account of adverse trade conditions. The following paragraph, which is an extract from a chapter upon the production of manganese in the United States in 1908, and appearing in the report of the United States Geological Survey, for that year, is by request herein reproduced:

USES.

"The uses of manganese in the industries may be classified as follows: 1. Metallurgical in the manufacture of alloys and in copper and silver reduction; (2) Chemical as an oxidizer, and as a coloring material.

METALLURGICAL USES.

"The manganese ores used in the manufacture of alloys are dependent in value upon the percentage of metallic manganese present, and on the absence of injurious substances like phosphorous and sulphur. The latter is especially true in the case of the alloys with iron. Spiegeleisen and ferro-manganese are alloys of iron and manganese. The former contains below 20 per cent manganese, while the latter has a manganese content ranging from 20 per cent to 90 per cent, above which the alloy becomes unstable. Silicon and carbon are present in varying quantities. Spiegeleisen and ferro-manganese are used in the manufacture of steel in the following ways: (a) As reducers of iron oxide in the final melting, in which case the manganese oxide formed goes into the slag; (b) as recarburizers of steel, in which case they contain desirable carbon; (c) for counteracting the effects of phosphorous and sulphur by the formation of manganese compounds with these elements; (d) in the manufacture of manganese steel used for railroad and street car rails and curves, for burglar-proof safes, for car wheels, and for other purposes. The addition of small quantities of manganese gives to steel hardness, ductility and strength.

"Manganese is also used to form alloys with copper, zinc, aluminum, tin, lead, magnesium and silicon, and with combination of these metals.

"Manganese oxides are used to a slight extent in copper and silver reduction as a substitute for iron oxides.

CHEMICAL USES.

"As an oxidizer manganese oxide is used in the manufacture of chlorine, bromine and oxygen, and of disinfectants like potassium permanganate; as a drier in paints and varnishes; as a decolorizer of glass, and in the Leclanche battery. In these cases the value of the ore depends on its available oxygen content—that is, on its percentage of pyrolusite or manganese peroxide.

"As a coloring material manganese is used in calico dyeing; for coloring bricks, glass and pottery, and in the manufacture of green and violet paints.

"Compounds of manganese are used in a small way for medicine, and the mineral rhodonite, a silicate of manganese, is used rarely for ornamental purposes on account of its beautiful pink color."

The production of manganese in the United States during 1909 amounted to 1,544 long tons, valued at $19,675, or $12.74 per ton. Practically the entire product came from Virginia.

There were imported 242,348 long tons of manganese oxide and ore in 1910, valued at $1,711,131.

MINERAL PAINTS

The following table gives the production and value of mineral paints in Tennessee in 1910, by counties:

Production and value of mineral paints in Tennessee in 1910.

COUNTY	Total Average Number of Employes	Metallic Paint		Mortar Colors		Total	
		Quantity (Short Tons)	Value	Quantity (Short Tons)	Value	Quantity (Short Tons)	Value
Bradley	12	575	$ 4,887	--------	--------	575	$ 4,887
James	10	--------	--------	500	$ 4,250	500	4,250
Wayne	10	300	2,500	10	120	310	2,620
Total	32	875	$ 7,387	510	$ 4,370	1,385	$ 11,757

RECAPITULATION

Total average number of employes	32
Average wages paid per day	$ 1.85
Total amount paid for labor	$ 9,725

The following table shows the product and value of mineral paints in the United States in 1909:

Product and value of natural mineral paints in the United States in 1909.

KIND	Quantity (Short Tons)	Value
Ocher	14,310	$ 137,880
Umber and Sienna	1,546	43,872
Metallic paint	25,414	256,373
Mortar Colors	11,620	116,126
Slate and shale (ground)	8,247	58,882
Total	61,137	$ 613,133

Note: Practically all ocher came from Georgia and Pennsylvania.

IMPORTS IN 1910.

KIND	Quantity (Pounds)	Value
White and white pigment containing lead, dry or in pulp, or ground or mixed with oil	686,052	$ 38,919
Red lead	822,289	32,750
Litharge	48,693	2,252
Orange mineral	600,461	32,199
Venetian red	2,490,138	25,708
Other metallic paints	----------	749,319
All other mineral paints not elsewhere specified	27,300,561	244,192
Total	----------	$1,123,339

The exports in 1910 amounted to 26,333,933 pounds of zinc oxide, valued at $943,968. Zinc oxide, known to the trade as zinc white, is the most important of the zinc pigments. It is represented by the formula ZNO, and is a white powder consisting by weight of 80.34 per cent zinc and 19.66 per cent oxygen.

MINERAL WATERS

The following table shows quantity and value by uses of mineral waters sold in Tennessee in 1910, by counties:

Production and value of mineral waters in Tennessee in 1910.

COUNTY	Number of Springs Reporting Sales	Quantity Sold (Gallons)	Average Retail Price Per Gallon at Spring	Value of Waters Sold		
				Medicinal Purposes	Table Purposes	Total
Blount	1	500	.02	10	--------	10
Cheatham	1	400	.045	5	13	18
Davidson	5	570,600	.053	16,362	13,612	29,974
Franklin	1	200	.80	160	--------	160
Grainger	1	175,000	.10	17,500	--------	17,500
Hawkins	2	39,128	.10	3,912	--------	3,912
Knox	1	60,000	.08	3,600	1,200	4,800
Macon	2	8,100	.11	880	--------	880
Montgomery	1	332	.05	17	--------	17
Rhea	1	12,000	.04	480	--------	480
Unicoi	1	300	.15	45	--------	45
Wilson	2	54,165	.08	5,208	--------	5,208
Total	19	920,725	.07	$ 48,179	$ 14,825	$ 63,004

It will be observed that Davidson County ranks first in both quantity and value of product, with Grainger second and Knox third as to quantity of product, and Wilson third as to value of product.

Name and location of springs in Tennessee.

County	Name of Spring	Location of Spring	Postoffice
Blount	Montvale	Chilhowie Mountain	Maryville.
do	Nebo	do	Walland.
do	Wildwood	do	Walland.
Cheatham	Willow Brook	Craggie Hope	Craggie Hope.
Davidson	Buena Vista	North Nashville	Nashville.
do	Bush Epsom Lithia	Nolensville Road, 3 mi.	Nashville
do	Pioneer	Eastland	Nashville
do	Richardson's Lockland	Lockland	Nashville
do	Sulphur (old)	Nashville	Nashville
do	Thompson's	Nashville, 6 mi	Nashville
Franklin	Eastbrook	Eastbrook	Estill Springs.
Grainger	Tate	Tate Springs	Tate Springs.
do	Lea	Lea Springs	Lea Springs.
Hawkins	Galbraith Epsom Well	Galbraith Springs	Galbraith Springs.
do	Wright's Epsom Lithia	Mooresburg	Mooresburg.
Henderson	Hinson	Hinson Springs	Hinson Springs.
Knox	Neuberts	Knoxville, 7 mi. So.	Knoxville.
do	Whittle	Knoxville	Knoxville.
Macon	Epperson	Westmoreland	Westmoreland.
do	Red Boiling	LaFayette, 15 mi.	Red Boiling Springs
Montgomery	Idaho	Clarksville	Clarksville.
Rhea	Rhea	Rhea Springs	Rhea Springs.
Sevier	Dupont	Chilhowie Mt. (top)	Sevierville, r. f. d.
Unicoi	Unaka	Unaka Mts	Unaka Springs.
Wilson	Hamilton	Horn Springs	Horn Springs.
do	Horn	Horn Springs	Horn Springs.

UNITED STATES PRODUCTION.

The production of mineral waters in the United States in 1909 amounted to 64,674,486 gallons, valued at $6,894,134, or 11 cents per gallon. The water sold for medicinal purposes amounted to $2,026,417, and the water sold for table use amounted to $4,867,717.

IMPORTS.

The imports of mineral waters entered for consumption in the United States in 1910 amounted to 3,517,617 gallons, valued at $961,686.

NATURAL GAS

There have been no active operations toward utilizing the natural gas in Tennessee, although it is known to exist in some quantity in many counties. In drilling for oil in Franklin County, gas was struck at a depth of 400 feet, which has been utilized for years. Gas is thought to be in a number of other counties in Middle and West Tennessee.

Prior to 1885 Pennsylvania produced all natural gas produced in the United States.

The following table gives the approximate value of the natural gas produced in the United States in 1885 and 1909, by States, from which may be seen the rapid development of this industry:

Natural gas in the United States in 1885 *and in* 1909.

STATE	1885	1909
Pennsylvania	$ 4,500,000	$ 20,475,207
West Virginia	40,000	17,538,565
Ohio	100,000	9,966,938
Kansas	----------	8,293,846
Oklahoma	----------	1,806,193
Indiana	----------	1,616,903
New York	196,000	1,222,666
Illinois	1,200	644,401
Kentucky	----------	485,192
Louisiana, Texas, Alabama	----------	453,253
California	----------	446,933
Arkansas, Colorado, Wyoming	----------	226,925
South Dakota	----------	16,164
Missouri	----------	10,025
North Dakota	----------	3,025
Tennessee	----------	350
Michigan	----------	255
Iowa	----------	50
Oregon	----------	50
Other States	20,000	----------
Total	$ 4,857,200	$ 63,206,941

NATURAL GAS CONSUMED IN THE UNITED STATES IN 1910.

PURPOSES	Quantity, 1,000 Cubic Feet	Cents Per 1,000 Cubic Ft.	Total Value
Domestic	151,222,223	24.23	$ 36,640,189
Industrial	329,483,951	8.06	26,566,752
Total	480,706,174	13.15	$ 63,206,941

PETROLEUM

There was some development concerning petroleum production in Overton County during 1910, but no commercial sales have been reported. The three oil wells in Fentress County have produced all commercial oil in Tennessee. They are now idle, and have been since the withdrawal of the Cumberland Pipe Line at Somerset, Ky., in 1906.

Tennessee belongs to the Appalachian oil field, the oils of which are practically free from sulphur and asphalt, are rich in paraffin wax, and yield a large percentage of gasoline and illuminating oils. The Appalachian oil field extends from Western New York southwest along the western side of the Allegheny Mountains through Pennsylvania, Eastern Ohio, West Virginia, Kentucky and Tennessee.

The following table shows total quantity and value of crude petroleum produced in the United States, and the average price per barrel in 1909:

Crude petroleum and value in the United States in 1909.

STATE	1909		
	Quantity *a*(Barrels)	Value	Average Price Per Barrel
California	54,433,010	$ 30,675,267	$ 0.564
Colorado	310,771	317,712	1.022
Illinois	30,898,339	19,788,864	.640
Indiana	2,296,086	1,997,610	.870
Kansas	1,263,764	491,633	.389
Kentucky	639,016	518,299	.811
Louisiana	3,059,531	2,022,449	.661
Michigan	5,750	7,830	1.362
Missouri			
New York	1,134,897	1,878,217	1.655
Ohio	10,632,793	13,225,377	1.244
Oklahoma	47,859,218	17,428,990	.364
Pennsylvania	9,299,403	15,424,554	1.659
Texas	9,534,467	6,793,050	.712
Utah	22,137	36,648	1.655
Wyoming			
West Virginia	10,745,092	17,642,283	1.642
Total	182,134,274	$128,248,783	$ .704

a The barrel used in this report contains 42 Winchester gallons.

WORLD'S PRODUCTION.

The world's production of petroleum in 1909 amounted to 297,413,791 barrels, or 39,804,647 metric tons, of which the United States produced 61.24 per cent.

PHOSPHATE ROCK

The following table gives name and postoffice of phosphate operators and superintendents of plants in Tennessee in 1910 by counties:

Phosphate operators and superintendents in Tennessee in 1910.

	OPERATORS		SUPERINTENDENTS	
No.	County and Name	Postoffice	County and Name	Postoffice
	Davidson County.		*Davidson County.*	
1	Charleston, S.C.M. & Mfg. Co.	Charleston, S. C.	E. W. Faucette	Mt. Pleasant.
	Decatur County.		*Decatur County.*	
2	Tenn. Valley Phosphate Co	Parsons	R. A. Gunn	Parsons.
	Giles County.		*Giles County.*	
3	American Phosphate Mining Co	Wales	E. B. Wilson	Wales
4	Consolidated Phosphate Co.	Columbia	John W. Fry	Columbia.
5	International Agricultural Cor	115 Brdwy, N. Y	G. W. Killebrew	Mt. Pleasant.
	Hickman County.		*Hickman County.*	
6	American Phos. Mining Co	Swan Bluff	E. B. Wilson	Swan Bluff
7	Bear Creek Phosphate Co.	Twomey	W. B. White	Columbia r.f.d.9
8	Charleston, S.C. M. & Mfg.Co.	Charleston, S. C.	E. W. Faucette	Mt. Pleasant.
9	Chickamauga Fer. Works	Atlanta, Ga.	J. D. McCarty, Rec.	Centreville.
10	Consolidated Phosphate Co.	Columbia	John W. Fry	Columbia
11	Corn Belt Phosphate Co	Centreville	H. Pike	Centreville.
12	Great Western Phosphate Co	Mt. Pleasant	Frank S. Wheeler	Fogg
13	Independent Phos. Co	Centreville	H. M. Jamison	Santa Fe, R. 2
14	Indian Creek Phos. Co	Centreville	E. M. Foster	Nashville.
15	International Agr. Cor	115 Brdwy, N. Y.	G. W. Killebrew	Mt. Pleasant.
16	Meridian Fertilizer Co	Meridian, Miss	A. J. Robertson	Centreville.
17	Prescott Phosphate Co	Boston, Mass.	J. D. C. Bradley	92 State St. B.
18	Standard Guano & Chem. Mfg. Co.	New Orleans		Centreville.
19	Tenn. Cotton Oil Co	Memphis	J. Myers	Twomey.
20	Volunteer State Phos. Co	Centreville	S. M. Ward	Centreville.
	Lawrence County.		*Lawrence County.*	
21	Big Swan Phosphate Co	Columbia	John W. Fry	Columbia.
	Lewis County.		*Lewis County.*	
22	Big Swan Phosphate Co	Columbia	John W. Fry	Columbia.
23	Charleston S. C. M. & Mfg. Co	Charleston, S. C.	E. W. Faucett	Mt. Pleasant.
24	Consolidated Phosphate Co.	Columbia	John W. Fry	Columbia.
	Marshall County.		*Marshall County.*	
25	F. H. Gault	Cornersville	F. H. Gault	Cornersville.
	Maury County.		*Maury County.*	
26	Akin Phosphate Co	Columbia	R. C. Ewing	Columbia.
27	Bear Creek Phos. Mining Co	Columbia	W. B. White	Columbia.
28	Brown Rock Phos. Co.	Mt. Pleasant	D. W. Shofner	Mt. Pleasant.
29	Cave Spring Phosphate Co	Mt. Pleasant, R.D.	M. B. Faris	Columbia.
30	Central Phosphate Co	Paris, France	W. A. Gray	Mt. Pleasant.
31	Charleston, S. C. M. & Mfg. Co	Charleston, S. C.	E. W. Faucett (3)	Mt. Pleasant.
32	Consolidated Phosphate Co	Columbia	John W. Fry	Columbia.
33	Federal Chemical Co	Louisville, Ky.	A. E. Sheldon	Columbia.
34	Globe Phosphate Co	Mt. Pleasant	Ed New	Mt. Pleasant.
35	Independent Phos. Co	Columbia	O. L. Dortch	Columbia.
36	International Agr. Corporation	115 Broadway, N.Y	O. L. Dortch	Columbia.
37	International Phosphate Co	Columbia	W. B. Ellett	Columbia, R. 1.
38	Kittrell Bros	Mt. Pleasant	J. W. Kittrell	Mt. Pleasant.
39	Knob Creek Phosphate Co	Columbia	John W. Fry	Columbia.
40	Petrified Bone Mining Co	Mt. Pleasant	J. Jones	Mt. Pleasant.
41	Phosphate Supply Co	Mt. Pleasant	E. Van Smith	Mt. Pleasant.
42	Ruhm Phosphate Mining Co	Mt. Pleasant	John Ruhm, Jr.	Mt. Pleasant.
43	Tenn. Chemical Co	Nashville		Mt. Pleasant, R.
44	W. V. Wilson	Mt. Pleasant	W. V. Wilson	Mt. Pleasant.
	Williamson County.		*Williamson County.*	
45	Bear Creek Phos. Mining Co	Columbia	J. L. Critz	Thompsons Sta.
46	International Agr. Corporation	115 Broadway, N.Y	G. W. Killebrew	Mt. Pleasant.

PHOSPHATE VALUES AND CLASSIFIED PRODUCT

The following table gives number of employes, wages paid per day, total amount paid for labor and classified value of phosphate product in Tennessee in 1910 by counties:

Phosphate employes and quantity and value of production in 1910.

COUNTY	Employes			Product (Long Tons)			Value of Product
	Total Average Number	Average Wages Paid Per Day	Total Amount Paid for Labor	Blue Rock	Brown Rock	Total	
Giles	90				18,570	18,570	$ 64,995
Hickman	129			14,483	100	14,583	a43,794
Lewis	151			54,100		54,100	201,875
Marshall	2				20	20	70
Maury	900				320,274	320,274	917,822
Williamson	35				2,137	2,137	6,413
Total	1,307	$ 1.33	$ 476,182	68,583	341,101	409,684	$ 1,234,969

a Blue rock values amount to $43,449.

The following table gives product and value of phosphate rock produced in Tennessee in 1910 compared with 1909:

Phosphate product and value in Tennessee in 1910 *compared with* 1909.

COUNTY	1910		1909		Increase + or Decrease—	
	Product (Long Tons)	Value	Product (Long Tons)	Value	Product (Long Tons)	Value
Giles	18,570	$ 64,995	17,895	$ 62,633	+ 675	+$ 2,362
Hickman	14,583	43,794	24,256	72.150	— 9,673	— 28,356
Lewis	54,100	201,875	41,982	83,124	+ 12,118	+ 118,751
Marshall	20	70			+ 20	+ 70
Maury	320,274	917,822	257,918	890,786	+ 62,356	+ 27,036
Sumner			5,770	23,311	— 5,770	— 23,311
Williamson	2,137	6,413	1,020	3,570	+ 1.117	+ 2,843
Total	409,684	$ 1,234,969	348,841	$ 1,135,574	+ 60,843	+$ 99,395

The following table gives total product and value of phosphate rock in Tennessee from 1894, the initial year of production, to 1910 inclusive:

Product and values of phosphate rock in Tennessee 1894-1910 *inclusive.*

YEAR	Product (L. Tons)	Value	Value per ton	YEAR	Product (L. Tons	Value	Value per ton
1894	19,188	$ 67,158	$ 3.50	1903	445,510	$ 1,434,660	$ 2.95
1895	38,515	82,160	2.13	1904	468,443	1,485,665	3.17
1896	26,157	57,370	2.20	1905	505,294	1,580,849	3.13
1897	128,723	193,115	1.50	1906	499,815	1,852,840	3.71
1898	308,107	498,392	1.62	1907	654,641	2,896,169	4.42
1899	462,561	1,272,022	2.75	1908	415,388	1,625,890	3.91
1900	450,856	1,352,568	3.00	1909	348,841	1,135,574	3.25
1901	394,139	1,186,033	3.01	1910	409,684	1,234,969	3.01
1902	454,078	1,341,161	2.95				
				Total	6,029,940	$ 19,296,595	$ 3.20

SALES AND DISPOSITION OF PRODUCT

The following table gives stock on hand at beginning and at end of year, quantity and amount of sales, and average prices obtained for domestic and export product by counties in 1910:

Stock on hand, sales and prices obtained for phosphate rock in Tennessee in 1910.

COUNTY AND KIND OF PRODUCT	Stock on Hand		Sales		Sale Price per Ton
	Beginning of Year (Long Tons)	End of Year (Long Tons)	Quantity (Long Tons)	Amount	
Giles ((brown rock)	573	986	18,157	$ 63,549	$ 3.50
Hickman:					
Blue rock	3,950	7,531	10,065	30,195	3.00
Brown rock	------	--------	937	2,811	3.00
Lewis:					
Blue rock (domestic)	12,612	710	66,002	247,508	3.75
Marshall (brown rock)	--------	20	--------	----------	------
Maury:					
Brown rock (domestic)	71,249	77,336	304,287	1,150,605	3.78
Brown rock (export)	------	--------	9,900	59,762	6.03
Williamson (brown rock)	150	--------	2,287	6,863	3.00
Total	88,534	86,583	411,635	$ 1,561,293	$ 3.80

The total sales, domestic and export, amounted to 411,635 long tons, valued at $1,561,293, or $3.80 per ton. As compared with 1909, this is an increase in product of 63,176 long tons, or 18.12 per cent, and an increase in value of $232,652, or 17.50 per cent.

The phosphate rock produced in Tennessee, and sold for consumption in the United States, during 1910, amounted to 401,735 long tons, which brought the sum of $1,501,531, or $3.73 per ton. As compared with 1909, this is an increase in product of 71,538 long tons, or 21.67 per cent, and an increase in value of $287,981, or 23.73 per cent, and an increase in value per ton of 5 cents.

The percentage of the total phosphate product marketed for home consumption in 1910 was 97.59 per cent, as against 94.75 per cent in 1909, and 84.19 per cent in 1908, practically all of which was consumed by the fertilizer manufacturers east of the Mississippi River.

The phosphate rock produced in Tennessee and sold for export purposes or consumption in foreign countries in 1910 amounted to 9,900 long tons, which brought the sum of $59,762, or $6.03 per ton. As compared with 1909, this is a decrease in product of 8,861 long tons, or 47.23 per cent, and a decrease in value of $55,239, or 48.02 per cent, and a decrease in value per ton of 7 cents.

The percentage of total phosphate product marketed for export purposes, or consumption in foreign countries in 1910, amounted to only 2.41 per cent, as against 4.08 per cent in 1909, and 15.81 per cent in 1908. The most notable feature connected with the export trade for the past two years, or since the holdings of the International Agricultural Corporation became so extensive, is the large decrease in the quantity of export rock sold for export purposes, as well as the increased prices obtained for the export product as compared with previous years.

METHOD OF MINING

Mining in the brown rock strata, which runs from 30 to 60 inches in thickness, is all surface mining, the over burden ranging from a few inches to 15 feet.

Mining in the blue rock strata, which runs from 20 to 48 inches in thickness, is all under ground and conducted by tunneling.

The cost of mining the blue rock is about 30 cents per ton more than the cost for mining the brown rock on account of the powder and dynamite necessary to be used. The entire marketed product is now cleaned and washed by machinery before drying, which not only saves a large quantity of rock heretofore wasted, but gives to the trade a rock with a higher grade of bone phosphate of lime, and makes the entire brown rock field practically an export product.

ANALYSES

Brown rock is found in the counties of Davidson, Giles, Hickman, Marshall, Maury, Sumner and Williamson.

The analyses of the brown rock in Maury County sold for domestic puposes run as follows:

	Per cent
Bone phosphate of lime (calcium phosphate)	70 to 78
Iron and alumina	2.75 to 7
Moisture	.05 to 3

The analyses of the brown rock in Maury County sold for export purposes run as follows:

	Per cent
Bone phosphate of lime (calcium phosphate)	78 to 82
Iron and alumina	2.75 to 7
Moisture	.05 to 2

The analyses of the brown rock in Davidson, Giles, Hickman, Sumner, and Williamson counties run as follows:

	Per cent
Bone phosphate of lime (calcium phosphate)	68 to 78
Iron and alumina	2.75 to 7
Moisture	.05 to 2

Blue rock is found in the counties of Hickman, Lawrence, Lewis and Maury.

The analyses of the blue rock run as follows:

	Per cent
Bone phosphate of lime (calcium phosphate)	68 to 78
Iron and alumina	2 to 4
Moisture	0 to 3

The analyses of the white rock in Decatur County run from 68 to 74 per cent bone phosphate of lime, with about 3 per cent iron.

The analyses of the white rock in Perry County run from 78 to 83 per cent bone phosphate of lime, and has less than 3 per cent of iron.

The low content of iron and alumina in the blue rock more than offsets the low content of bone phosphate of lime and places it in direct competition with the brown rock sold for both domestic and export purposes.

FIELD TEST FOR PHOSPHATE ROCK

The following simple test for testing phosphate rock, by F. B. Van Horn, of the U. S. Geo. Survey is given:

Place a small crystal of ammonium molybelate on the rock to be tested, then drop a little dilute nitric acid on the crystal. If the crystal turns yellow it indicates the presence of phosphorus. The deeper the yellow the higher the phosphate it contains.

EXPORT COUNTRIES.

The exports of phosphate rock produced in Tennessee during 1910 were confined to the brown rock from Maury County. The reports of operating companies show the number of long tons exported to each country as follows:

	Quantity	Value
France (long tons)	1,300	$ 5,720
Italy (long tons)	8,600	54,042
Total (long tons)	9,900	$59,762

It will be observed that Italy still ranks first in export countries. Practically all exports of phosphate rock go through the port at Pensacola, Fla.

GROWTH OF THE PHOSPHATE INDUSTRY IN THE UNITED STATES.

In order that the growth of the phosphate industry may be shown since 1892, the first year for which the statistics are available, the production and value of phosphate rock in the United States by States, classified by grades and based upon the marketed product, are given for the years 1892 and 1909.

Production of phosphate rock in the United States in 1892 and 1909, based upon the marketed product.

STATES	1892			1909		
	Quantity (Long Tons)	Value	Sale Price per ton	Quantity (Long Tons)	Value	Sale Price per ton
Florida						
Hard rock	a155,908	$ 859,276	$ 5.53	513,585	$ 4,026,333	$ 7.84
Land pebble	21,905	111,271	5.08	1,266,117	4,514,968	3.56
River pebble	b102,820	415,453	4.04			
Soft rock	6,710	32,418	5.00			
Total	287,343	$ 1,418,418	$ 4.90	1,779,702	$ 8,541,301	$ 4.79
South Carolina						
Land rock	243,653	1,236,447	$ 5.07	201,254	$ 888,611	$4.41
River rock	150,575	641,262	4.25	6,700	21,975	3.28
Total	394,228	$ 1,877,709	$ 4.76	207,954	$ 910,586	$ 4.37
Tennessee						
Blue rock				66,705	$ 275,165	$ 3.79
Brown rock				266,298	1,011,028	4.12
White rock						
Total				333,003	$ 1,286,193	$ 3.86
Other states				c9,493	$ 34,040	$ 3.58
Grand total	681,571	$ 3,296,127	$ 4.83	2,330,152	$ 10,772,120	$ 4.62

a—Includes 52,708 tons of hard rock carried over in stock from 1891.
b—Includes 12,120 tons of river pebble carried over in stock from 1891.
c—Includes Arkansas, Idaho, Utah and Wyoming.

IMPORTS AND EXPORTS.

The following table shows the quantity and value of all fertilizers imported and entered for consumption in the United States in 1910:

KIND	QUANTITY (Long Tons)	VALUE
Guano (free)	44,268	$ 699,949
Crude phosphates (free)	21,707	235,040
Kainite (free)	582,197	2,598,199
Apatite, bone dust and other substances used only for manure (free)	440,131	6,551,549
Total fertilizer imports		$ 10,084,737

The following table gives quantity and value of all fertilizer exports in 1910:

KIND	QUANTITY (Long Tons)	VALUE
Phosphate rock ground, or unground (not acidulated)	1,083,037	$ 8,234,276
All other	41,806	1,218,061
Total fertilizer exports		$ 9,452,337

WORLD'S PRODUCTION

The world's production of phosphate rock in 1906, 1907 and 1908 was as follows:

World's production of phosphate rock 1906-1908, *by countries in metric tons.*

COUNTRY	1906		1907		1908	
	Quantity	Value	Quantity	Value	Quantity	Value
Algeria	333,531	$ 965,600	373,763	$ 2,183,404	452,060	$ 2,639,940
Araba (Dutch West Indies)	26,138	*a*	36,036	*a*	29,061	*a*
Belgium	152,140	282,612	182,230	332,114	198,030	355,897
Canada	521	4,024	748	6,018	1,448	14,794
Christmas Island (Straits Settlements)	92,010	*a*	112,147	*a*	110,849	*a*
France	469,408	1,872,000	431,237	1,876,736	485,607	1,896,606
Norway	3,482	46,524	*b*			
Spain	1,300	7,592	*b*			
Tunis	796,000	2,304,400	1,069,000	4,547,842	1,300,543	5,531,624
United Kingdom			33	224	9	68
United States	2,114,252	8,579,437	2,301,588	10,653,558	2,424,453	11,399,124
Total	3,988,782	$14,062,189	4,506,782	$19,599,896	5,002,060	$21,838,053

a—Value not reported. *b*—Statistics not yet available.

In 1908 the United States furnished 48.48 per cent of the total world's product, and Tennessee produced 8.30 per cent, or one twelfth of the total world's product, and more than one-sixth of the total United States' product.

PHOSPHATE ROCK RESERVES

There are at present five producing phosphate fields in the United States. They are (1), Florida; (2), Tennessee; (3, South Carolina; (4), Arkansas, and (5), Idaho, Wyoming and Utah, which is the largest and most extensive.

It is thought that the deposits of France and Belgium, which are the largest producing phosphate fields except Tunis and the United States, have been practically exhausted. The South Carolina field has been reduced to the low grade rock, while Florida and Tennesse have each attained their maximum production. The Arkansas field is of low grade, and freight rates will probably prevent extensive development of the important field in Southwest Idaho, Utah and Wyoming.

QUARTZ

The quartz deposits in Tennessee occur in two forms. One form is the massive crystalline quartz, which is a hard, vitreous quartzite of Cambrian age, and occurs in veins or dikelike masses, and is used as a flux in copper smelting. The operations in Tennessee in 1910 were all in Polk County, and were as follows:

Total average number of employes	65
Average wages paid per day	1 60
Total amount paid for labor	$28,081
Total quartz product (short tons)	60,298
Total value	$33,865

As compared with 1909, this is a decrease in product of 22,797 short tons, or 27.43 per cent, and a decrease in value of $47,687, or 58.47 per cent.

The other quartz deposit in Tennessee occurs in Bradley County, 4 miles west of Cleveland, at Black Fox. It is from 700 to 900 feet in depth and 1 mile in length, and is used in the manufacture of white silex and tripoli. There is a plant now being constructed at this point for the purpose of refining the product for use as a wood filler and in the manufacture of soap. Operations during 1909 were limited to development work.

USES.

The following data obtained from the report of mines and mineral resources of the U. S. Geo. Survey as to the uses of quartz is given: Quartz of the kind dealt with in this report is used for a great variety of purposes, the principal uses being, in the manufacture of wood filler, pottery, paints and scouring soaps. In pottery, the quartz serves to diminish shrinkage in the body of the ware; it is used also in many glazes. Quartz for these purposes should be nearly free from iron bearing minerals. In general the analysis should show less than one-half of 1 per cent of iron oxide. Finely ground quartz is used in paints in various proportions up to one-third of the total pigment used. Its chemical inertness prevents it from combining with other constituents of the paint and increases the resistance of the paint to the weather. Chrystalline quartz is superior to silica sand for this purpose, because the ground particles are highly angular and tend to attach themselves more firmly to the painted surfaces, thus giving the paint what is known as a "tooth," and after some wear, affording a good surface for repainting. This angularity of the grain also renders the ground chrystalline quartz superior to silica sand in the manufacture of wood fillers. In scouring soaps and polishers, ground chrystalline quartz is preferred to silica sand, not only because of its greater angularity, but because of its superior whiteness.

Massive quartz, crushed and graded to various degrees of fineness is extensively used in the manufacture of sand paper, sand belts as a scouring agent, with sand blast apparatus. The qualities which render it particularly serviceable for these purposes are its hardness (No. 7 in the moles scale), which is slightly greater than that of steel, and its conchoidal fracture, the absence of definite cleavage planes, causing it to crush to fragments with sharp angular edges and corners. For such abrasive purposes, massive quartz is far superior to sand or crushed sandstone, since the grains of the latter are likely to be more or less rounded. Blocks of massive quartz and quartzite are used in the chemical industry as a filler for acid towers, and to some extent as a flux in copper smelting.

SAND AND GRAVEL

The following table shows the product and value of sand and gravel in Tennessee in 1910 by counties, classified by uses in cubic yards of 2,500 pounds:

Sand and gravel product in Tennessee in 1910.

COUNTY	Total Number of Employes	1 Molding Sand		2 Building Sand		3 Stone Sand		4 Engine Sand		5 Furnace Sand	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Benton	30	------	-------	-------	-------	-----	------	------	-------	-----	------
Carter	4	------	-------	5,191	$ 2,018	-----	------	593	$ 296	1,162	$ 452
Davidson	42	1,682	$ 695	24,464	18,821	-----	------	2,504	2,101	-----	------
Decatur	73	------	-------	-------	-------	-----	------	------	-------	-----	------
Hamilton	19	3,408	3,400	11,400	8,850	-----	------	------	-------	-----	------
Hardeman	8	2,261	746	2,100	690	-----	------	121	54	95	60
Henry	5	2,100	1,120	-------	-------	-----	------	------	-------	-----	------
Hickman	4	------	-------	-------	-------	-----	------	------	-------	1,361	1,161
Knox	31	4,565	2,413	27,000	12,000	5,000	$2,500	2,000	500	2,000	1,000
Madison	2	214	264	400	60	-----	------	------	-------	-----	------
Marion	10	------	-------	7,600	5,900	-----	------	------	-------	-----	------
Maury	2	------	-------	-------	-------	-----	------	------	-------	1,200	600
Roane	8	417	208	10,540	13,126	-----	------	600	680	1,680	1,247
Shelby	65	------	-------	110,683	74,251	-----	------	9,398	2,738	-----	------
Total	303	14,647	$ 8,846	199,378	$135,716	5,000	$2,500	15,216	$ 6,369	7,498	$4,520

Sand and gravel product and value in 1910—*continued* (*cubic yards of* 2,500 *lbs.*)

COUNTY	6 Other Sand		7 GRAVEL Roofing		Concrete		Road Making		8 TOTAL	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Benton	------	-------	-----	------	-------	-------	1,500	$ 600	1,500	$ 600
Carter	------	-------	-----	------	-------	-------	-------	-------	6,946	2,766
Davidson	25,179	$12,636	-----	------	9,675	$ 5,572	-------	-------	63,495	39,825
Decatur	------	-------	-----	------	3,000	2,250	17,937	15,132	20,937	17,382
Hamilton	------	-------	-----	------	-------	-------	-------	-------	14,808	12,250
n	3,445	1,085	-----	------	-------	-------	-------	-------	8,272	2,950
Henry	------	-------	-----	------	-------	-------	1,000	1,000	8,100	2,120
Hickman	------	-------	-----	------	-------	-------	-------	-------	1,361	1,161
Knox	6,000	2,500	-----	------	-------	-------	-------	-------	46,565	20,913
Madison	------	-------	-----	------	-------	-------	-------	-------	614	324
Marion	------	-------	-----	------	-------	-------	-------	-------	7,600	5,900
Maury	------	-------	-----	------	-------	-------	-------	-------	1,200	600
Roane	------	-------	-----	------	-------	-------	-------	-------	13,237	15,261
Shelby	------	-------	1,257	2,332	114,754	101,462	96,018	39,959	332,110	220,742
Total	34,615	$16,221	1,257	$2,332	127,429	$109,284	116,455	$56,691	521,745	$342,794

RECAPITULATION

Total average number of employes	303
Average wages paid per day	$ 1.55
Total amount paid for labor	$ 86,231

PRODUCT AND VALUE BY USES

KIND OF PRODUCT	Quantity (Cubic Yards 2,500 lbs.)	Total Value	Value Per Cubic Yard
Building sand:			
Concrete	167,503	$108,751	$ 0.65
Mortar	31,875	26,965	0.85
Total Building Sand	199,378	$135,716	0.68
Molding sand	14,647	8,846	0.60
Stone sand	5,000	2,500	0.50
Engine sand	15,216	6,369	0.42
Furnace sand	7,498	4,520	0.60
Filtration sand	1,170	636	0.55
Glass sand	250	315	1.26
Other sand	33,445	15,585	0.47
Total sand	276,604	$174,487	$ 0.63
Gravel:			
Roofing	1,257	$ 2,382	$ 1.85
Concrete	127,429	109,284	0.86
Road making	116,455	56,691	0.48
Total gravel	245,141	$168,307	$ 0.68
Grand total sand and gravel	521,745	$342,794	$ 0.66

If it is desired to figure these statistics on the basis of short tons add one-fourth to the product herein given. This would give total quantity of product as 652,184 short tons of 2,000 pounds, valued at $342,794, or 52 cents per ton.

The production of sand and gravel in Tennessee in 1909 amounted to 590,888 cubic yards of 2,500 lbs., valued at $365,216, or 62 cents per cubic yard.

The bulk of sand and gravel product is dredged from the Mississippi and Tennessee rivers. Of the total gravel product, $56,691, or 33 per cent, was expended for road-making, and $109,284, or 65.60 per cent, was used in the manufacture of concrete for building and other purposes.

The price of sand varies with its treatment after taken from the pit. Sand sold as dredge brings the lowest value. Sand washed, dried, screened and then shipped, commands a higher price. Sand crushed from stone commands a higher value than natural sand.

UNITED STATES PRODUCTION

The production of sand and gravel in the United States in 1909 amounted to 59,565,551 short tons, valued at $18,336,990, or 31 cents per ton. Of this product, glass sand amounted to 1,033,832 short tons, valued at $1,088,572, or $1.05 per ton. The average price received by producers of sand and gravel in Tennessee in 1909 was 49 cents per short ton, which exceeds the average prices obtained in the United States 18 cents per ton.

STONE

The value of all stone produced in Tennessee in 1910 amounted to $1,490,188. As compared with $1,192,250 in 1909, and $1,263,549 in 1908. The values of limestone and marble showed an increase, while sandstone values showed a decrease. The statistics given in this chapter embrace stone sold by the quarrymen, and only such manufactured product as is placed upon the market by the producers.

The statistics will show the valuable deposits of limestone, marble and sandstone now undergoing development by counties.

Owing to the many uses to which stone is put there is no regular unit of measurement employed in its sale. It is sold by the cubic yard, cubic foot, ton, cord, perch, rod, square yard, square foot, square, etc. Building and monumental, and practically all dressed stone, is sold by the cubic foot. In reporting the stone product herein the department has therefore reduced all product to short tons of 2,000 pounds, except marble, which is given in cubic feet.

Limestone reported does not include limestone burned into lime or limestone used in the manufacture of Portland cement.

It will be observed that practically nine-tenths of the Tennessee marble product is now being sold dressed, whereas, prior to 1909 only about two-thirds was sold dressed. The substantial increase in the value of product is attributable to this.

The following table gives the total product and value of all stone produced in Tennessee in 1910, compared with 1909:

Stone product and values in Tennessee in 1910, *compared with* 1909.

YEAR	Limestone		Marble		Sandstone		Total Value
	Quantity (Short Tons)	Value	Quantity (Cubic Feet)	Value	Quantity (Short Tons)	Value	
1910	913,556	$ 612,456	464,636	$ 877,432	225	$ 300	$1,490,188
1909	904,177	600,190	334,274	590,585	734	1,475	1,192,250
Increase + or decrease −	+ 9,379	+$ 12,266	+ 130,362	+$286,847	− 509	−$1,175	+$297,938

The following table shows the total values of stone produced in Tennessee in 1910, and the purposes for which it was used:

Value of limestone, marble and sandstone in Tennessee in 1910, *and purposes for which it was used.*

KIND	Building (Dressed & Rough)	Interior Decorations	Monumental (Dressed and Rough)	Rubble	Riprap	Crushed Stone	Blast Furnace Flux	Other (Dressed & Rough)	Total
Limestone	$18,061	-------	------	$2,093	$40,769	$427,012	$120,616	$ 3,905	$ 612,456
Marble	61,039	$721,884	10,500	------	-------	--------	--------	84,009	877,432
Sandstone	300	-------	------	------	-------	--------	--------	--------	300
Total	$79,400	$721,884	10,500	$2,093	$40,769	$427,012	$120,616	$ 87,914	$1,490,188

STONE USED FOR BUILDING PURPOSES.

The folowing table gives value of limestone, marble and sandstone produced in Tennessee in 1910, and used for building purposes:

Value of stone produced in Tennessee in 1910 *used for building purposes.*

KIND	Rough	Dressed	Total
Limestone	$ 3,991	$ 14,070	$ 18,061
Marble	41,039	20,000	61,039
Sandstone	300	----	300
Total	$ 45,330	$ 34,070	$ 79,400

As compared with 1909, this is a small increase of $7,721.

LIMESTONE

The following table gives total number of employes and value of limestone production in Tennessee in 1910 by counties and uses:

Value of limestone produced in Tennessee in 1910 *by uses.*

COUNTY	Total Average Number of Employes	Building (Rough)	Building (Dressed)	Crushed Stone: Road Making	Crushed Stone: Railroad Ballast	Crushed Stone: Concrete	Blast Furnace Flux	Rubble	Riprap	Paving	Curbing	Other	Total Value
Campbell	70	$----	$----	$ 1,901	$ 5,414	$ 1,380	$20,432	$----	$ 225	$----	$----	$----	$29,352
Carter	28	----	----	----	----	----	13,965	----	----	----	----	----	13,965
Cocke	50	----	----	8,055	----	----	----	----	----	----	----	----	8,055
Coffee	7	----	----	----	4,845	----	----	----	----	----	----	----	4,845
Davidson	320	527	----	136,625	35,980	32,300	36	----	21,246	----	----	1,632	228,346
Dickson	36	----	----	----	----	----	21,396	----	----	----	----	----	21,396
Franklin	30	----	----	17,000	----	----	----	----	----	----	----	----	17,000
Giles	4	150	100	----	----	----	----	100	----	----	355	400	1,105
Hamilton	67	3,114	1,970	6,910	10,231	17,620	2,100	1,993	----	----	----	175	44,113
Hawkins	10	----	12000	20,000	----	----	----	----	----	----	----	----	32,000
Hickman	13	----	----	----	----	----	15,782	----	----	----	----	----	15,782
James	7	----	----	----	----	----	3,332	----	----	----	----	----	3,332
Jefferson	60	----	----	54,364	----	----	----	----	----	----	----	----	54,364
Knox	65	----	----	19,600	1,250	125	----	----	37	1,265	----	----	22,277
Lawrence	7	200	----	----	----	----	----	----	----	----	----	----	200
Marshall	3	----	----	500	----	----	----	----	----	----	----	----	500
Maury	50	----	----	4,000	----	7,482	12,614	----	----	----	----	78	24,174
Montgomery	30	----	----	----	----	----	16,209	----	----	----	----	----	16,209
Putnam	50	----	----	35,520	----	----	----	----	----	----	----	----	35,520
Rhea	35	----	----	----	5,340	----	8,071	----	----	----	----	----	13,411
Roane	20	----	----	----	----	----	5,704	----	----	----	----	----	5,704
Rutherford	2	----	----	570	----	----	----	----	----	----	----	----	570
Smith	45	----	----	----	----	----	----	----	6,699	----	----	----	6,699
Stewart	2	----	----	----	----	----	975	----	----	----	----	----	975
Sumner	30	----	----	----	----	----	----	----	790	----	----	----	790
Trousdale	70	----	----	----	----	----	----	----	11,772	----	----	----	11,772
Total	1,111	3,991	14070	305,045	63,060	58,907	120,616	2,093	40,769	1,265	355	2,285	612,456

RECAPITULATION.

Total average number of employes	1,111
Average wages paid per day	$1.40
Total amount paid for labor	$319,022

LIMESTONE PRODUCT AND VALUE BY USES.

The following table gives product and value of limestone produced in Tennessee in 1910 by uses:

Product and value of limestone in Tennessee in 1910 by uses.

KIND OF PRODUCT	Amount (Short Tons)	Value	Value Per Ton
Building:			
Dressed	4,205	$ 14,070	$ 3.34
Rough	648	3,991	6.16
Total building	4,853	$ 18,061	$ 3.72
Crushed stone:			
Road making	369,585	305,045	0.82
Railroad ballast	144,600	63,060	0.44
Concrete	105,183	58,907	0.56
Total crushed stone	619,368	$427,012	$ 0.69
Flagging	650	400	0.61
Rubble	3,043	2,093	0.68
Riprap	48,548	40,769	0.84
Blast furnace flux	234,697	120,616	0.51
Agriculture	2,397	1,885	0.78
Total	289,335	$165,763	$ 0.57
Curbing	-------	355	-------
Paving	-------	1,265	-------
Grand total	-------	$612,456	-------

CRUSHED STONE.

It will be observed from the above table that the total crushed stone product in 1910 amounted to 619,368 short tons, valued at $427,012, or 0.69 cents per ton. As compared with 1909, this is an increase in crushed stone product of 25,593 short tons, or 4.27 per cent, and an increase in crushed stone values of $35,592, or 9.10 per cent. This increase is attributable to the activity in road building in Tennessee. A number of counties have issued bonds and made other preparations necessary for the construction of new roads in 1911, as well as for the substantial improvement of the roads now built.

The crushed stone industry has shown a constant increase for several years past, and will doubtless continue to increase as the demand for good roads continues. In the following table of statistics will be seen the value of building and crushed stone in the United States from 1899 to 1909 inclusive:

Value of building and crushed stone in the United States, 1899-1909.

YEAR	Building Stone (Rough and Dressed)	Crushed Stone	YEAR	Building Stone (Rough and Dressed)	Crushed Stone
1899	$a10,741,927	$4,692,343	1904	$ 18,883,455	$15,530,122
1900	10,672,598	6,525,368	1905	20,240,809	16,419,614
1901	15,112,600	8,560,432	1906	20,681,625	17,467,486
1902	20,790,341	11,480,959	1907	16,675,811	22,054,297
1903	19,795,491	13,188,938	1908	16,040,630	20,262,012
			1909	17,594,455	24,078,780

a—Does not include stone sold rough for building.

MARBLE.

The following table gives total number of employes and value of marble production in Tennessee in 1910 by counties:

Value of marble product in Tennessee in 1910 classified by uses.

COUNTY	Total Average Number of Employes	Rough			Dressed				Grand Total
		Building	Monumental	Other Purposes	Building	Monumental	Interior Decoration	Other Purposes	
Blount	215	$ 6,700	$	$	$	$	$235,937	$	$242,637
Hawkins	25						2,750	5,300	8,050
Knox	517	27,000	8,000	21,634	20,000	2,500	466,257	42,871	588,262
Loudon	20	7,339							7,339
Union	61			14,204			16,940		31,144
Total	838	$ 41,039	$8,000	$ 35,838	$ 20,000	$2,500	$721,884	48,171	$877,432

RECAPITULATION

Total average number of employes	838
Average wages paid per day	$ 1.35
Total amount paid for labor	$ 306,898

PRODUCT AND VALUE BY USES.

KIND	Quantity (Cubic Feet)	Value	Value Per Cubic Foot	Per Cent of Total Value
Rough:				
Building	34,393	$ 41,039	$ 1.19	4.67
Monumental	2,900	8,000	2.75	0.91
Other purposes	23,236	35,838	1.54	4.08
Total rough	60,529	$ 84,877	$ 1.40	9.66
Dressed:				
Building	5,000	$ 20,000	$ 4.00	2.28
Monumental	500	2,500	5.00	0.26
Interior decorations	381,015	721,884	1.89	82.30
Other purposes	a17,592	48,171	2.73	5.50
Total dressed	404,107	$792,555	$ 1.96	90.34
Grand total	464,636	$877,432	$ 1.88	100.00

a—1,125 cubic feet or 9,000 square feet used in decorating furniture.

It will be observed that 82.21 per cent of the total marble value was used for interior decorations, which is a larger percentage of marketed product furnished for that purpose than that of any State in the Union. In 1908 Tennessee was second to California in this particular, but now leads.

Tennessee is third in rank as to total marble product, Vermont is first and Georgia second.

Of the total marketed product only 9.66 per cent was used rough for building purposes, as against 8.13 per cent so used in 1909 and 32.90 per cent in 1908.

The Tennessee marble is noted for its great burden bearing strength, and practical and competent tests have demonstrated that it is the most compact stone of its character in existence. Its compactness renders it useful for outside work and its beauty creates a demand for its use in interior decorations and ornamental purposes.

Its color ranges from a very dark chocolate, with small dotted spots of white, to an almost pure white.

Monuments constructed of Tennessee marble do not absorb tanin or stains from soot or sulphur fumes, and stains from other causes can be removed with soap and water.

The marble belt in Tennessee averages about 20 miles in width and extends from McMinn County to Hawkins County, a distance of about 150 miles. The entire belt is traversed by the Southern Railroad, and the developments in Blount, Knox and Loudon counties are also served by the Louisville & Nashville Railroad.

Knoxville is the central point of operations, and several mills are located there, which are constantly run to their full capacity.

The value of marble product in Tennessee from 1898 to 1910 inclusive, is as follows:

Year	Value	Year	Value	Year	Value
1898	$216,814	1902	$518,256	1906	$576,259
1899	334,705	1903	438,450	1907	699,041
1900	424,054	1904	523,872	1908	761,222
1901	494,637	1905	536,729	1909	590,585
				1910	877,432

UNITED STATES PRODUCTION.

The following table shows the value of marble production in the United States in 1909 by States and uses:

Value of marble product in the United States in 1909 by uses.

STATE OR TERRITORY	ROUGH			DRESSED					TOTAL
	Building	Monumental	Other Purposes	Building	Monumental	Ornamental	Interior Decorations	Other Purposes	
Alabama	$ 39,825	$ 22,783	$ 6,900	$ 12,000	$ -------	$ ------	$ 129,554	$ 1,400	$a212,462
Alaska	42,100	300	500	-------	4,000	------	-------	------	b46,900
Arizona	-------	------	-------	-------	-------	------	-------	------	c
California	83,887	563	4,942	-------	-------	------	-------	------	89,392
Colorado	190,600	175	-------	-------	-------	------	295,491	------	d488,311
Georgia	528,454	25,000	15,745	156,000	26,250	------	-------	15,000	766,449
Kentucky	-------	-------	-------	-------	-------	------	-------	------	e
Maryland	-------	-------	-------	-------	-------	------	-------	------	e
Massachusetts	23,759	900	1,424	16,500	53,372	695	134,561	12,500	243,711
New Mexico	500	2,950	940	1,000	-------	------	-------	-------	f5,390
New York	64,400	49,950	32,641	135,919	88,559	------	31,260	-------	402,729
North Carolina	-------	-------	-------	-------	-------	------	-------	-------	e
Oregon	-------	-------	-------	-------	-------	------	-------	-------	d
Pennsylvania	29,108	1,700	5,751	107,978	7,500	------	34,000	-------	186,037
Tennessee	130,315	4,625	35,575	36,478	4,275	------	394,973	7,500	613,741
Texas	-------	-------	-------	-------	-------	------	-------	-------	c
Utah	-------	-------	-------	-------	-------	------	-------	-------	g
Vermont	455,300	462,580	66,144	827,144	998,671	24,000	537,944	122,000	3,493,783
Washington	-------	-------	-------	-------	-------	------	-------	-------	h
West Virginia	-------	-------	-------	-------	-------	------	-------	-------	e
Total	1,588,248	$571,526	$170,562	$1,293,019	$1,184,672	$24,695	$1,557,783	$158,400	$6,548,905

a includes Kentucky, Maryland, North Carolina and West Virginia. *b* includes Washington. *c* included in New Mexico. *d* Includes Oregon and Utah. *e* Included in Alabama. *f* Includes Arizona and Texas. *g* Included in Colorado. *h* Included in Alaska.

Note—See end of chapter on stone for all stone imposts and exports.

SANDSTONE

The following table gives total number of employes and value of sandstone production in Tennessee in 1910 by counties and uses:

Value of sandstone product in Tennessee in 1910 *by counties and uses.*

COUNTY	Total Average Number of Employes	Rough Building	Total
Franklin	2	$ 300	$ 300
Total	2	$ 300	$ 300

RECAPITULATION

Total average number of employes	2
Average wages paid per day	$ 1.50
Total amount paid for labor	$170.00

PRODUCT AND VALUE BY USES.

KIND	Quantity (Short Tons)	Value	Value per ton
Building:			
Dressed		$	$
Rough	225	300	1.33
Total	225	$ 300	$ 1.33

The sandstone deposits of Tennessee are especially suited for building purposes. They are available in the Chilhowie Mountains in Blount, Sevier and Monroe counties, and in the counties of Morgan and Anderson. The most important area of sandstone in Tennessee, however, that has been developed is along the western rim of the Cumberland Mountain in the counties of Bledsoe, Franklin, Putnam and White. This stone is known as the Cumberland Buff Stone, and has a light brown color. When first quarried it is easy to treat, but after being quarried for a few days it becomes nearly as hard and difficult to handle as granite. Where its destination for final use requires a long haul, this peculiarity in its formation necessitates the treatment of the product before leaving the quarry.

Sandstone developments in Tennessee can be extended as desired upon the establishment of freight rates that would permit the producer to reach the market and compete with other stone product.

UNITED STATES PRODUCTION OF SANDSTONE.

The value of sandstone produced in the United States in 1909 by uses is as follows:

Crushed Stone:	
Road making	$ 393,831
Railroad ballast	283,117
Concrete	535,983
Total crushed stone	$1,212,931
Building (rough)	1,701,341
Building, (dressed)	1,648,178
Curbing	937,767
Flagging	955,283
Ganister	240,409
Paving	600,200
Riprap	276,640
Rubble	365,893
Other	71,812
Total	$8,010,454

These figures include $1,446,402 of blue stone produced in New York and Pennsylvania.

IMPORTS AND EXPORTS OF STONE.

The following table gives the value of all stone imports and exports for the calendar year 1910.

Imports of stone into the United States in 1910.

KIND	Quantity	Value
Mosaic cubes of marble, creccia or onyx not exceeding 2 cubic inches in size (loose), lbs.	3,226,306	$ 42,829
Marble and creccia in block or squared only, (cubic feet)	682,003	1,112,617
Onyx, rough or squared only (cubic feet)	9,143	58,736
Marble and creccia, squared or dressed, over 2 inches in thickness, cubic feet	446	958
Marble, onyx and creccia, slabs or paving tiles, with not less than 4 superficial inches, (sup. feet)	426,756	75,040
Marble creccia and onyx, all other		221,985
Total marble, creccia and onyx, dut		$ 1,512,165
Slates and all manufactures, dut		9,977
All other stone manufactures, dut		353,680
All other stone manufactures, free		497,651
Grand total stone imports		$ 2,373,473

Exports of stone from the United States in 1910.

KIND	Value
Marble and stone, mannfactured	$ 1,035,088
Marble and stone, unmanufactured	503,251
Total exports	$ 1,538,339

ZINC AND LEAD

The following table gives zinc and lead operations in Tennessee in 1910 by counties:

Zinc and lead operations in Tennessee in 1910.

COUNTY	Average Number of Employes	ORES				METAL CONTENT			
		Lead Concentrates—Carbonate		Zinc Concentrates—Blende and Carbonate		Lead		Zinc	
		Quantity (Short Tons)	Value	Quantity (Short Tons)	Value	Quantity (Pounds)	Value	Quantity (Pounds)	Value
Jefferson	85			2,899	$ 69,959			2,132,082	$115,132
Total	85			2,899	$ 69,959			2,132,082	$115,132

RECAPITULATION.

Total average number of employes	85
Average wages paid per day	$ 1.40
Total amount paid for labor	$ 43,289

No lead was produced in Tennessee in 1910. Some zinc operations in Tennessee produce both lead and zinc, but the operations in 1910 were confined to those mines producing zinc only.

The product and value of zinc and lead produced in Tennessee since operations began, including prospects, are as follows:

Zinc and lead product and value in Tennessee 1902-1910.

YEAR	ORES				METAL CONTENT			
	Lead Concentrates—Carbonate		Zinc Concentrates—Blende and Carbonate		Lead		Zinc Blende & Carbonate	
	Quantity (Short Tons)	Value	Quantity (Short Tons)	Value	Quantity (Pounds)	Value	Quantity (Pounds)	Value
1902	225		420		40,000	$ 2,000	26,000	$ 1,620
1903	610		1,700		115,500	5,760	104,500	6,120
1904	780		300		147,500	7,200	18,500	1,200
1905	1,120		774		213,400	10,670	48,000	2,874
1906	415		200		78,500	3,750	12,500	751
1907	85		1,118		15,700	785	251,198	14,824
1908			1,554				371,677	26,570
1909			2,022	$48,236			1,573,076	115,962
1910			2,899	$69,959			2,132,082	115,132

IMPORTS AND EXPORTS IN 1910.

The lead imported and entered for consumption in the United States in 1910 amounted to $4,266,171. The total zinc imports amounted to $1,362,060.

The total lead exports amounted to $614,158, and the total zinc exports $1,558,271.

WORLD'S PRODUCTION.

During 1909 there were produced 1,172,315 short tons of lead in the world, of which the United States produced 354,188 short tons, or 30.2 per cent. Missouri was first in rank, with 142,650 short tons, while Idaho was second, with 97,183 short tons.

During 1909 there were produced 854,066 short tons of zinc spelter in the world, of which the United States produced 255,760 short tons, or 29.9 per cent. Apportioned according to service of ore, the State of Missouri was first in rank of producing States, with 140,676 short tons, or 61.10 of the total United States supply.